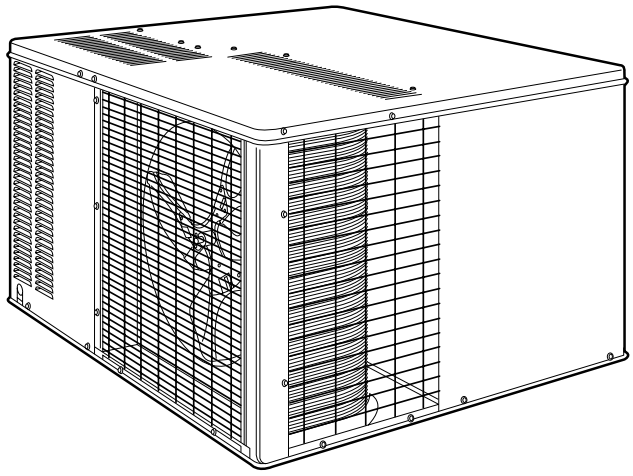
Carrier®
HEATING & COOLING

Product Data

50HX High Efficiency Single-Packaged Heat Pumps

2 to 5 Nominal Tons



UNIT 50HX

High Efficiency, Single-Packaged Heat Pump for Manufactured Housing and Residential use.

Features/Benefits

One-piece heat pumps with optional electric heaters; low installation costs; highly efficient, dependable performance; and easy maintenance.

Efficient operation

High-efficiency design with SEERs (Seasonal Energy Efficiency Ratios) of 12.0 and HSPFs (Heating Seasonal Performance Factors) of up to 7.2.

Easy Installation

Factory-assembled package is a compact, fully self-contained, heat pump unit that is pre-wired, pre-piped, and pre-charged for minimum installation expense.

50HX units are available in a variety of standard cooling sizes to meet residential requirements.

Unit is installed easily on a rooftop or ground-level pad. The optional base rail provides an elevated base.

Convertible duct configuration

on the 50HX is designed for easy use in either downflow (vertical) or horizontal discharge applications.

Carrier means Top Quality and Reliability

Each component is designed and tested for years of operation under the harshest conditions

Every unit is thoroughly run tested at the factory in each operating mode and evacuated prior to final charging. Automated run testing allows accurate undisputed tests and measurements which are second to none in the industry.

Durable, dependable components

Scroll compressors are designed for high efficiency. Each scroll compressor is hermetically sealed

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against contamination to help promote longer life and dependable operation. Vibration isolation provides quiet operation. Scroll compressors are standard on all units. Compressors have internal high-pressure and over-current protection.

Direct-drive multi-speed, PSC (permanent split capacitor) blower motor is standard on sizes 024-042 and variable speed (integrated control motor) is standard on sizes 048 and 060.

Direct-drive, PSC outdoor-fan motors are designed to help reduce energy consumption and provide for cooling operation down to 40°F.

Refrigerant system is designed to provide dependability. Liquid refrigerant strainers are used to promote clean, unrestricted operation. Loss-of-charge switch is standard on all units. Each unit leaves the factory with a full refrigerant charge. Refrigerant service connections make checking operating pressures easier.

A fixed metering device controls refrigerant flow precisely.

Solid-state Time Guard® circuit protects the compressor by preventing potentially damaging too-rapid cycling. Time Guard circuit is standard on all units.

Indoor and outdoor coils are computer-designed for optimum heat transfer and cooling efficiency. Outdoor coil is fabricated of copper tube and aluminum fins and is located inside the unit to protect against damage and ensure long life and reliable operation. The outdoor coil is protected by a coil grille.

Copper fin coils are also available by special order. These coils are recommended in applications where aluminum fins are likely to be destroyed due to corrosion. They are ideal for seacoast applications.

Chronotemp™ defrost system provides time/temperature-based defrost cycles to maintain unit efficiency. This highly reliable system checks for coil icing conditions at preset time intervals and initiates a defrost cycle only if required. The defrost cycle ends as soon as defrosting is accomplished.

The Chronotemp defrost board may be configured for 30, 50, or 90 minutes.

Indoor air quality is improved with cleanable foil-faced insulation. Interior surfaces of the indoor compartment are insulated with cleanable foil-faced insulation to help keep the conditioned air from being affected by the outdoor ambient temperature and to provide improved air quality. Unit sloped condensate and drain pan conform to American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) No. 62P. Sloped condensate pan is made of non-corrosive material.

Low sound ratings ensure a quiet indoor and outdoor environment with sound ratings as low as 78 dB.

Easy to service cabinets provide easy accessibility to serviceable components during installation and maintenance. Rounded corners are an important safety feature. A high-quality finish ensures an attractive appearance.

The cabinet is constructed of galvanized steel, bonderized and coated with a prepainted baked enamel finish. The paint finish is a non-calking type, and is capable of withstanding Federal Test method Standard No. 141 (Method 6061) 500-hour salt spray test. In addition, all internal cabinet panels are primed, allowing the entire unit to have a longer life and more attractive appearance.

Compact size enables the unit to be located where space is limited.

The standard control system is readily adaptable to all conventional and programmable thermostats. In addition, units are suitable for integration into building monitor control systems if required.

All units are designed with a single continuous top piece to eliminate any possible leaking at the seams or gasketing, which tends to deteriorate over time and shift during rigging procedures.

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Features/Benefits (cont)

Low-voltage wiring connections are easily made due to the terminal board which is conveniently located for quick simple access.

Field-installed accessory electric heaters are available in a wide range of capacities. Single-point wiring kit makes installation simple.

Downflow-only option is shipped from factory for vertical ductwork connection and requires no conversion.

Optional base rail provides holes for rigging and forklifts as well as an elevated mounting frame that gives additional structural support to horizontal installations.

Serviceability

Easily accessible refrigerant access ports on all discharge, suction, and liquid lines permit easy and accurate measurements.

Model number nomenclature

50HX 024 3 - -

Model No.
50HX – Single Packaged Electric Heat Pump

Nominal Cooling Capacity (Tons)
024 – 2
030 – 2-1/2
036 – 3
042 – 3-1/2
048 – 4
060 – 5

Options
- - – Standard Unit
AA – Base Rail
AB – Downflow with Base Rail
AC – CU Outdoor Coil with Base Rail
AT – E-Coat on Outdoor Coil with Base Rail
AU – CU Outdoor Coil, CU Indoor Coil with Base Rail
CC – CU Outdoor Coil
CU – CU Indoor & Outdoor Coils
TP – Tin Plated Indoor Coil Hairpins
TB – TP with Base Rail
TC – CU Outdoor Coil, Base Rail and TP
TD – E-Coat on Outdoor Coil, Base Rail and TP
TE – E-Coat on Outdoor Coil and TP
TF – CU Outdoor Coil and TP
TL – TP with Downshot and Base Rail
TT – E-Coat on Outdoor Coil

V-Ph-Hz
3 – 208/230-1-60

Legend - Coil Fin Type (AL unless noted)
AL — Aluminum
CU — Copper

ARI* capacities

COOLING AND HEATING CAPACITIES AND EFFICIENCIES

UNIT 50HX (–SERIES)	NOMINAL TONS	STANDARD CFM	NET COOLING† CAPACITIES AT 95°F (Btuh)	SEER†	NET HEATING† CAPACITIES AT 47°F (Btuh)	COP† At 47°F (Btuh)	NET HEATING† CAPACITIES AT 17°F (Btuh)	COP† At 17°F (Btuh)	HSPF	SOUND RATINGS** (dB)
024-311	2	800	23,200	12.0	23,200	3.2	13,000	2.0	6.9	78
024-321	2	750	23,000	12.0	23,200	3.2	13,000	2.0	7.0	78
030	2-1/2	1000	28,600	12.0	28,200	3.2	15,400	1.9	7.1	78
036	3	1200	35,000	12.0	33,000	3.2	18,000	1.9	7.0	80
042	3-1/2	1400	41,500	12.0	40,000	3.3	21,000	1.9	7.0	80
048-301	4	1600	46,000	12.0	42,000	3.4	23,600	2.0	7.0	82
048-311	4	1550	46,000	12.0	42,000	3.4	23,600	2.0	7.0	82
060	5	1300	57,000	11.0	57,000	3.5	31,800	2.0	7.2	82

LEGEND
dB — Sound Levels (1 bel = 10 decibels)
COP — Coefficient of Performance
DOE — Department of Energy
HSPF — Heating Seasonal Performance Factor
SEER — Seasonal Energy Efficiency Ratio

* Air Conditioning & Refrigeration Institute.
† Rated in accordance with ARI Standard 210/240, latest revision and/or U.S. Government DOE test procedures.
** Rated in accordance with ARI Standard 270, latest revision.

ARI* Capacities (cont)

OUTDOOR SOUND: OCTAVE BAND DATA — DECIBELS

FREQUENCY (Hz)	SOUND POWER LEVEL FOR 50HX UNIT					
	024	030	036	042	048	060
63	49.0	52.8	49.2	50.0	53.2	54.3
125	60.7	59.2	62.3	64.7	65.4	65.1
250	68.1	71.9	69.1	70.4	74.5	71.5
500	69.3	69.7	70.9	69.9	74.3	72.7
1000	70.6	70.4	74.7	75.3	75.2	73.9
2000	68.8	68.8	69.3	73.8	72.6	73.4
4000	65.2	65.2	65.2	75.1	68.6	71.7
8000	59.4	57.1	58.3	69.2	61.2	66.3

Physical data

UNIT SIZE 50HX	024	030	036	042	048	060
REFRIGERANT	R-22					
Refrigerant Control*	Acutrol™ System					
SHIPPING WEIGHT (lb)						
Without Base Rails	309	340	368	368	411	425
With Optional Base Rails	296	327	355	355	398	412
COMPRESSOR TYPE	Scroll					
INDOOR FAN	Centrifugal — Direct Drive					
Speeds	3	3	3	3	Variable	Variable
Rpm (High Speed)	1075	1075	1100	1100	–	–
Diameter (in.)	10	10	10	10	10	10
Width (in.)	9	9	9	9	10	10
Nominal Airflow (Cfm)	800	1000	1300	1400	1550	1800
Motor Hp	1/4	1/4	1/2	1/2	1.0	1.0
INDOOR COIL						
Rows—Fins/in.	3—15	3—15	4—15	4—15	4—15	4—15
Face Area (sq ft)	3.6	3.6	4.5	4.5	4.5	4.5
OUTDOOR FAN	Propeller — Direct Drive					
Cfm	2200	2200	2200	2400	2400	2400
Rpm	1100	1100	1100	1100	1100	1100
Diameter (in.)	20	20	20	20	20	20
Motor Hp	1/4	1/4	1/4	1/4	1/3	1/3
OUTDOOR COIL						
Rows—Fins/in.	2—17	2—17	2—17	2—17	2—17	2—17
Face Area (sq ft)	7.00	7.00	8.66	8.66	8.66	8.66
FILTER SIZE (in.)†						
Throwaway	24 x 24	24 x 24	24 x 30	24 x 30	24 x 30	24 x 30

*Operating charge listed on unit nameplate.
† Recommended field-supplied filters are 1 in. thick.
NOTE: Sizes 048 and 060 are equipped with an indoor integrated control motor (ICM).

Options and accessories

Factory-installed options

Unit with base rail provides holes for rigging and forklifts, as well as an elevated mounting frame that gives additional structural support for horizontal installations.

Downflow option provides for easy vertical ductwork connections. Unit is equipped with base rail.

Coil options include Tin-Plated* indoor hairpins, copper/copper and vinyl-coated construction for refrigerant coils. Units are shipped standard with copper tube/aluminum fin construction. See model number nomenclature for coil options.

*Tin-Plated indoor coils are built with special hairpins that are designed to resist both general pitting corrosion and excessive indoor corrosion (Formicary Corrosion).

Field-installed accessories

ACCESSORY	
Roof Curb	8 in.
	11 in.
	14 in.
30% Manual Outdoor-Air Damper	
Filter Rack	
Duct Cover Kit	
Lifting Bracket Kit	
Rectangular Duct Connection Kit	
Outdoor Thermostat	
Electronic Programmable Thermostat	
Controls Upgrade Kit	
Low-Ambient Kit	
Electric Heat with Single-Point Kit (5.0 to 20.0 kW)	
Downshot-to-Sideshot Conversion Kit	

Factory-assembled roof curbs are designed for use on downflow discharge applications. Heavy gage, galvanized steel construction provides one-piece support. The curb complies with the standards of the NRCA (National Roofing Contractors Association). A wood nailing strip is provided for attaching the roofing to the curb.

30% manual outdoor-air damper provides for minimum outdoor air and is manually adjustable.

Electronic programmable thermostat provides 2-stage heating and 2-stage cooling control with remote communication ability.

Low-ambient kit (Motormaster® II device) allows the use of mechanical cooling down to outdoor ambient temperatures as low as 0°F.

Electric heaters provide heat in the unit when required. Each package has a heater module that slides into keyed mounting slots in the fan inlet. Heater sizes range from 5.0 to 20.0 kW. An available single-point power supply for the entire unit results in lower installed costs.

Controls upgrade kit contains high- and low-pressure switches to provide additional safety features and protect the unit from running at unsuitable pressures.

One-inch filter rack features easy installation, service-ability, and high filtering performance.

Duct cover kit covers horizontal ducts after unit has been converted to downflow discharge. Kit is not required with the downflow option.

Lifting bracket kit provides attachment points for rigging straps. The kit is not required when the unit is equipped with an optional base rail.

Rectangular duct connection kit allows easy conversion from round to rectangular ducts. Not required for sizes 048 and 060.

Outdoor thermostat allows for staging of electric heaters based on outdoor-air temperatures.

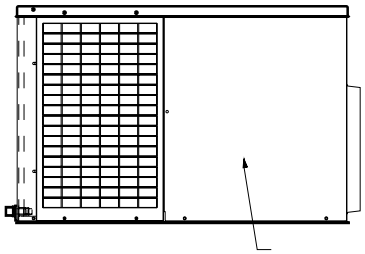
Downshot-to-sideshot conversion kit converts a dedicated downshot (vertical) discharge unit to a sideshot (horizontal) discharge unit.

Dimensions

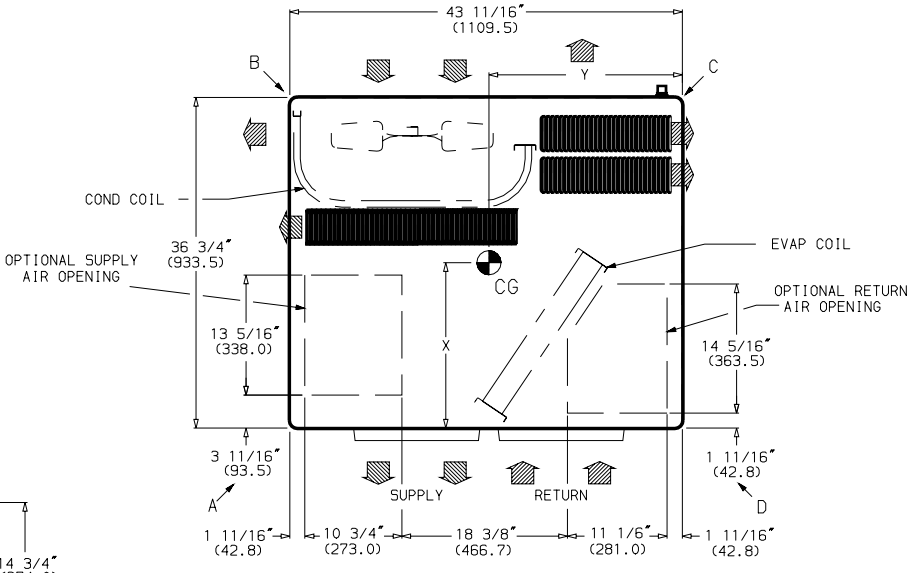
REQ'D CLEARANCES FOR SERVICING.
INCHES (mm)
EVAP COIL ACCESS SIDE.....30 (762.0)
CONTROL BOX ACCESS SIDE.....30 (762.0)
(EXCEPT FOR NEC. REQUIREMENTS)
UNIT TOP.....36 (914.4)
SIDE OPPOSITE DUCTS.....30 (762.0)

REQ'D CLEARANCES TO COMBUSTIBLE MATL.
INCHES (mm)
UNIT TOP.....0
DUCT SIDE OF UNIT.....0
SIDE OPPOSITE DUCTS.....0
BOTTOM OF UNIT.....0
VERTICAL DISCHARGE
FIRST 12 INCHES (304.8) OF SUPPLY DUCT....1 (25.4)

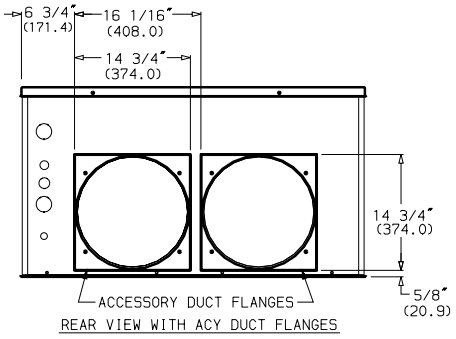
NEC. REQ'D CLEARANCES.
INCHES (mm)
BETWEEN UNITS, CONTROL BOX SIDE.....42 (1066.8)
UNIT AND UNGROUNDED SURFACES, CONTROL BOX SIDE.....36 (914.4)
UNIT AND BLOCK OR CONCRETE WALLS AND OTHER
GROUNDED SURFACES, CONTROL BOX SIDE.....42 (1066.8)



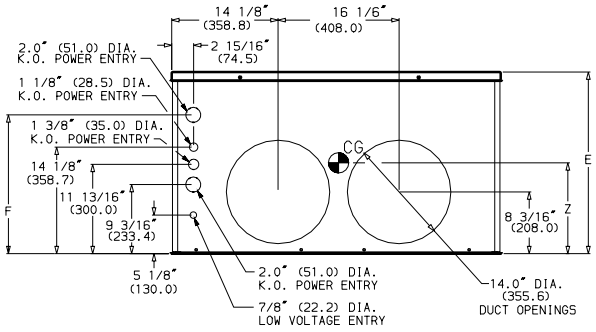
RIGHT SIDE VIEW



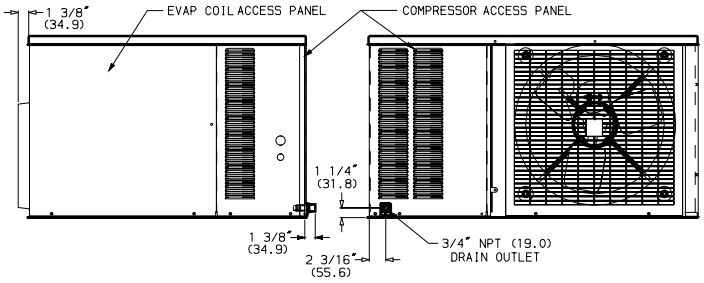
NOTE: CLEARANCES MUST BE MAINTAINED TO PREVENT RECIRCULATION OF AIR FROM OUTDOOR FAN DISCHARGE.



REAR VIEW WITH ACY DUCT FLANGES



REAR VIEW



LEFT SIDE VIEW

FRONT VIEW

SIZES 024-030 WITHOUT BASE RAIL

UNIT 50HX	ELECTRICAL CHARACTERISTICS	UNIT WEIGHT		CORNER WEIGHT (Lb/Kg)				UNIT HEIGHT (in./mm)	DIMENSION (in./mm)
		lb	kg	A	B	C	D	E	F
024	208/230-1-60	257	117	57/26	69/31	75/34	56/25	28.12/714.2	22.18/463.4
030	208/230-1-60	288	131	56/25	87/40	74/34	71/32	28.12/714.2	22.18/563.4

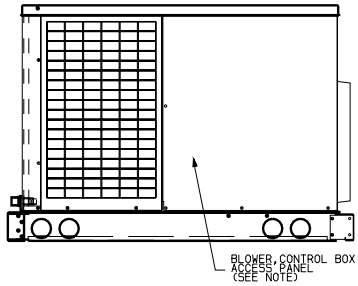
UNIT 50HX	CENTER OF GRAVITY		
	X	Y	Z
024	20.43/519	21.27/540	11.25/286
030	20.38/518	21.54/547	11.25/286

Dimensions (cont)

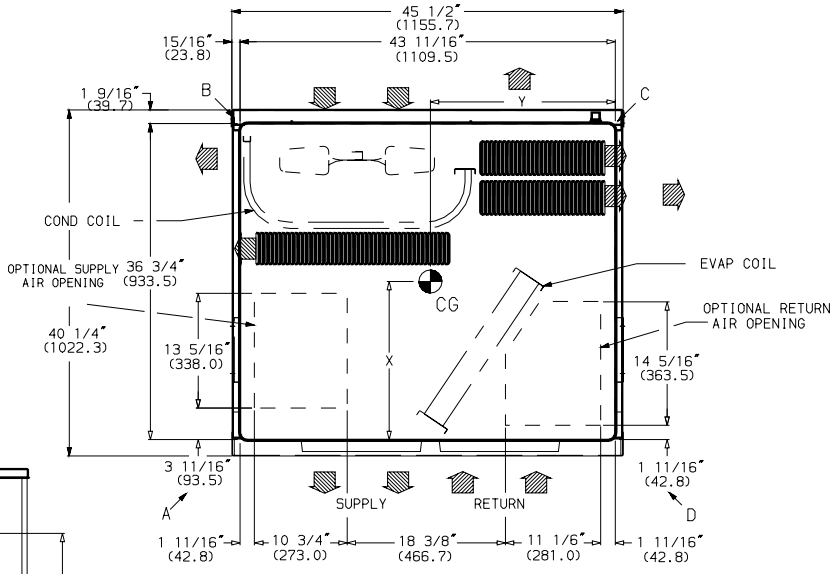
REQ'D CLEARANCES FOR SERVICING.
INCHES (mm)
EVAP COIL ACCESS SIDE.....30 (762.0)
CONTROL BOX ACCESS SIDE.....30 (762.0)
(EXCEPT FOR NEC. REQUIREMENTS)
UNIT TOP.....36 (914.4)
SIDE OPPOSITE DUCTS.....30 (762.0)

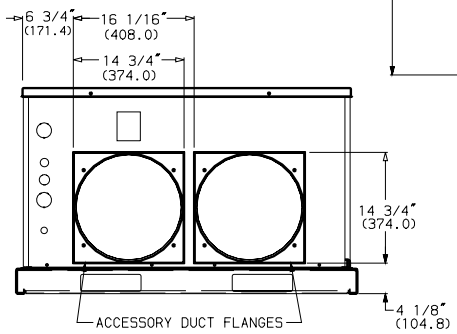
REQ'D CLEARANCES TO COMBUSTIBLE MATL.
INCHES (mm)
UNIT TOP.....0
DUCT SIDE OF UNIT.....0
SIDE OPPOSITE DUCTS.....0
BOTTOM OF UNIT.....0
VERTICAL DISCHARGE
FIRST 12 INCHES (304.8) OF SUPPLY DUCT....1 (25.4)

NEC. REQ'D CLEARANCES.
INCHES (mm)
BETWEEN UNITS, CONTROL BOX SIDE.....42 (1066.8)
UNIT AND UNGROUNDED SURFACES, CONTROL BOX SIDE.....36 (914
UNIT AND BLOCK OR CONCRETE WALLS AND OTHER
GROUNDED SURFACES, CONTROL BOX SIDE.....42 (1066.8)



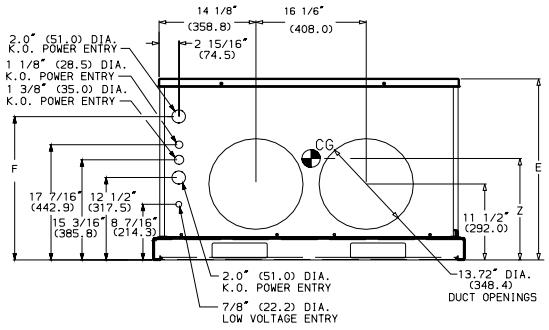
RIGHT SIDE VIEW



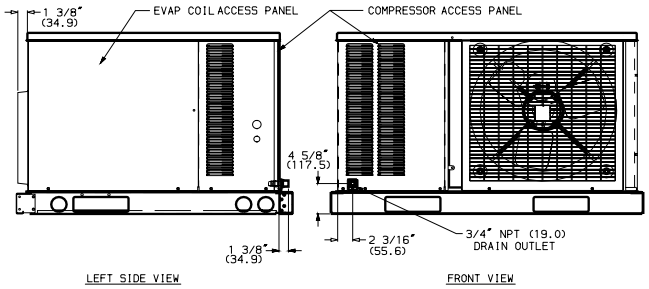


REAR VIEW WITH ACY DUCT FLANGES

NOTE: CLEARANCES MUST BE MAINTAINED TO PREVENT RECIRCULATION OF AIR FROM OUTDOOR FAN DISCHARGE.



REAR VIEW



LEFT SIDE VIEW

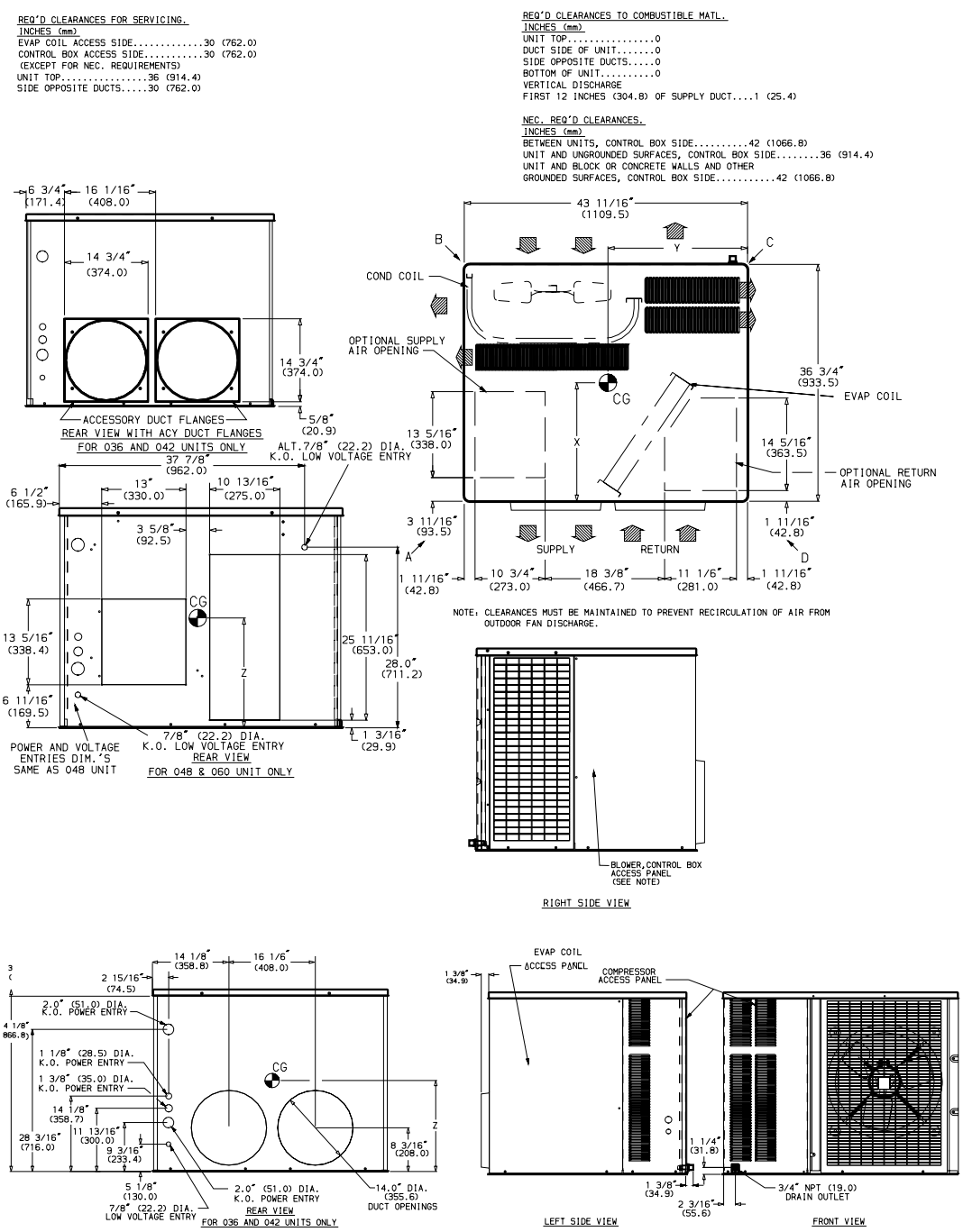
FRONT VIEW

SIZES 024-030 WITH OPTIONAL BASE RAIL

UNIT 50HX	ELECTRICAL CHARACTERISTICS	UNIT WEIGHT		CORNER WEIGHT (Lb/Kg)				UNIT HEIGHT (in./mm)	DIMENSION (in./mm)
		lb	kg	A	B	C	D	E	F
024	208/230-1-60	277	126	62/28	74/34	80/36	61/28	31.43/798.2	25.50/647.7
030	208/230-1-60	308	140	61/28	92/42	79/36	76/35	31.43/798.2	25.50/647.7

UNIT 50HX	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
024	20.27/515	21.30/541	13.83/351
030	20.24/514	21.55/547	13.83/351

Dimensions (cont)

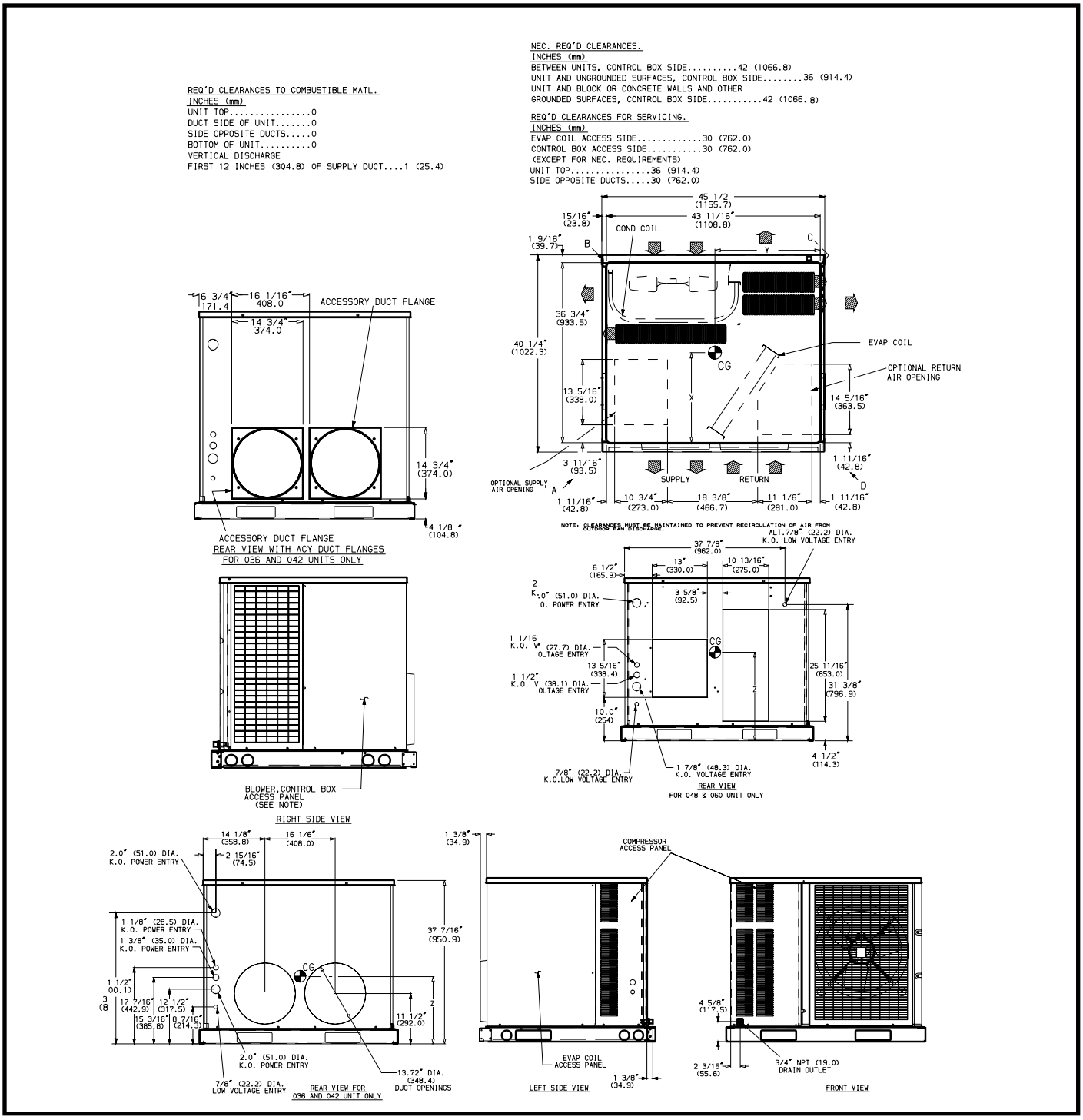


SIZES 036-060 WITHOUT BASE RAIL

UNIT 50HX	ELECTRICAL CHARACTERISTICS	UNIT WEIGHT		CORNER WEIGHT (Lb/Kg)				UNIT HEIGHT (IN)
		Lb	Kg	A	B	C	D	
036	208/230-1-60	316	144	46/21	103/47	81/37	86/39	34-1/8
042	208/230-1-60	316	144	46/21	103/47	81/37	86/39	34-1/8
048	208/230-1/60	359	163	89/40	81/37	113/51	76/35	34-1/8
060	208/230-1/60	373	170	92/42	85/39	116/53	80/36	34-1/8

UNIT 50HX	CENTER OF GRAVITY		
	X	Y	Z
036	21.23/539	20.46/520	13.65/347
042	21.23/539	20.46/520	13.65/347
048	19.70/500	20.54/522	15.00/381
060	19.65/499	20.59/523	15.00/381

Dimensions (cont)



SIZES 036-060 WITH OPTIONAL BASE RAIL

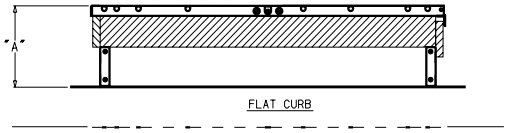
UNIT 50HX	ELECTRICAL CHARACTERISTICS	UNIT WEIGHT		CORNER WEIGHT (Lb/Kg)				UNIT HEIGHT (IN)
		Lb	Kg	A	B	C	D	
036	208/230-1-60	336	153	51/23	108/49	86/39	91/41	37-7/16
042	208/230-1-60	336	153	51/23	108/49	86/39	91/41	37-7/16
048	208/230-1/60	379	172	94/43	86/39	118/54	81/37	37-7/16
060	208/230-1/60	393	179	97/44	90/41	121/55	85/39	37-7/16

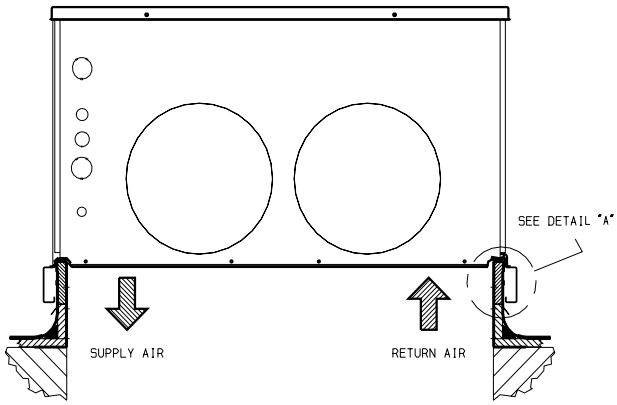
UNIT 50HX	CENTER OF GRAVITY		
	X	Y	Z
036	21.05/535.0	20.53/521.0	16.47/418.0
042	21.05/535.0	20.53/521.0	16.47/418.0
048	19.62/498.3	20.61/523.5	17.31/439.7
060	19.58/497.3	20.64/524.3	17.31/439.7

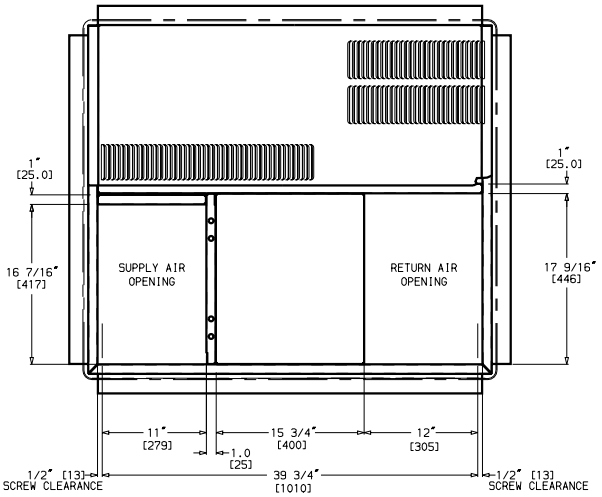
Dimensions (cont)

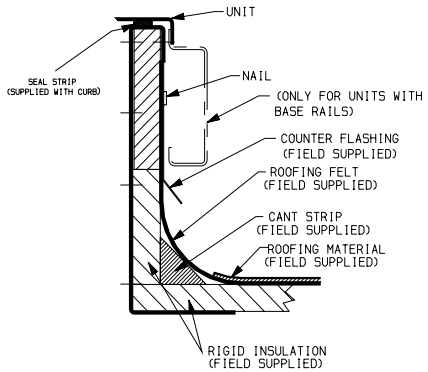
	PART NO.	"A"
FLAT	CPRFCURB001A00	8" [203]
	CPRFCURB002A00	11" [279]
	CPRFCURB003A00	14" [356]

1. ROOFCURB MUST BE SET UP FOR UNIT BEING INSTALLED.
2. SEAL STRIP MUST BE APPLIED AS REQUIRED FOR UNIT BEING INSTALLED.
3. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
4. ROOFCURB IS MADE OF 16 GAUGE STEEL.
5. ATTACH DUCTWORK TO CURB (FLANGES OF DUCT REST ON CURB).
6. SERVICE CLEARANCE 4 FEET ON EACH SIDE.
7. ▨ DIRECTION OF AIR FLOW.
8. INSULATED PANELS: 1" THK. FIBERGLASS 1# DENSITY.

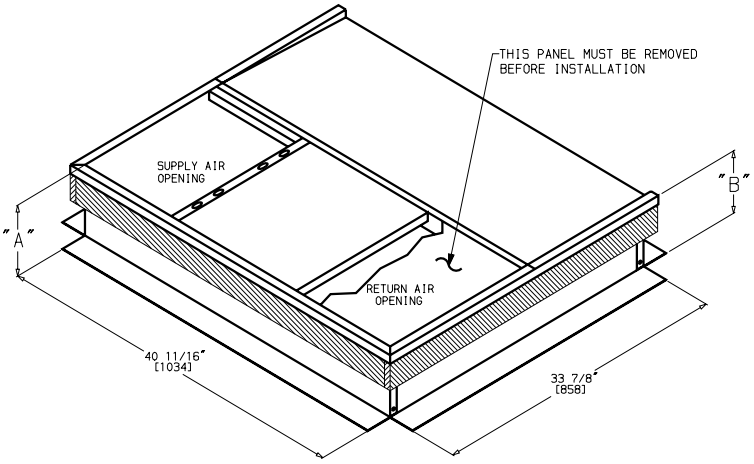






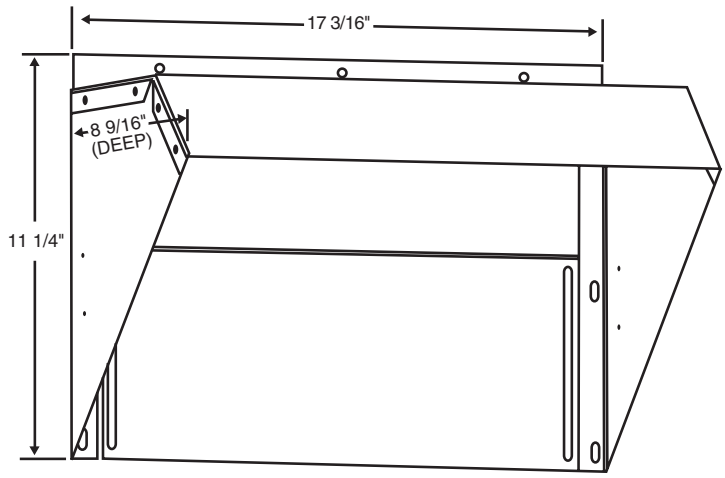


DETAIL "A"



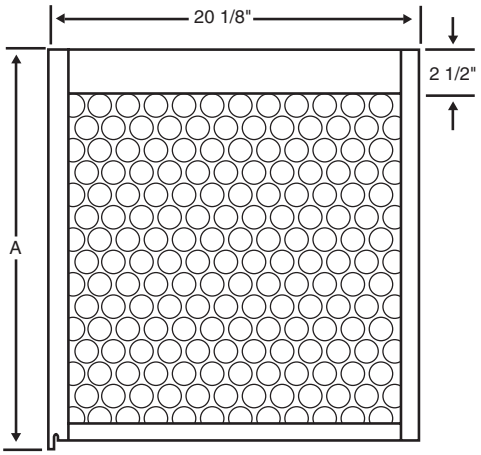
Dimensions (cont)

MANUAL OUTDOOR-AIR DAMPER



ACCESSORY	PART NUMBER	HEIGHT
MANUAL OUTDOOR AIR DAMPER	CPMOAPAC001A00	24-in
	CPMOAPAC002A00	28-in
	CPMOAPAC003A00	34-in

FILTER RACKS AND FILTERS



ACCESSORY	PART NUMBER	"A"
FILTER RACK	CPFILTRK003A00	31 11/16-in
	CPFILTRK002A00	25 11/16-in

Selection procedure

I Determine cooling and heating requirements at design conditions:

Given:

Required Cooling Capacity (TC)	28,000 Btuh
Sensible Heat Capacity (SHC)	20,500 Btuh
Required Heating Capacity	28,550 Btuh
Outdoor Entering-Air Temperature	95°F
Outdoor-Air Winter Design Temperature	20°F
Indoor-Air Winter Design Temperature	70°F
Indoor Entering-Air Temperature	80°F edb 67°F ewb
Indoor-Air Quantity	1125 cfm
External Static Pressure	0.40 in. wg
Electrical Characteristics (V-Ph-Hz)	230-1-60

edb — entering dry bulb
ewb — entering wet bulb

II Select unit based on required cooling capacity.

Enter Cooling Capacities table at condenser entering temperature of 95°F, indoor air entering at 1125 cfm and 67°F ewb. The 50HX030 unit will provide a total cooling capacity of 28,800 Btuh and a sensible heat capacity of 21,900 Btuh.

For indoor-air temperature other than 80°F edb, calculate sensible heat capacity correction, as required, using the formula foundin Note 3 following the Cooling Capacities tables.

NOTE: Unit ratings are net capacities.

III Select electric heat.

Enter the unit 50HX030 Heating Capacities table at 1125 cfm. At 70°F return indoor air and 20°F air entering outdoor coil, the integreated heating cacpacity is 15,300 Btuh. (Select integrated heating capacity value since deductions for outdoor-coil frost and defrosting have already been made. No correction is required.).

The required heating capacity is 28,550 Btuh. Therefore, 13,250 Btuh (28,550 — 15,300) addtional electric heat is required.

Determine additional electric heat capacity in kW.

$$\frac{13{,}250 \text{ Btuh}}{3414 \text{ Btuh/kW}} = 3.9 \text{ kW of heat required}$$

Enter the 50HX Electric Heater Package—208/240 V, Single-Phase, Single-Point Wiring Connections table on page 22 for unit 50HX030. The 5-kW heater at 240 v most closely satsfies the heating required. To calculate kW at 230 v, multiply the heater kW by multiplation factor 0.92 found in the Wattage Multiplicaiton Factors table on page 19.

5 kW × 0.92 = 4.6 kW
4.6 kW × 3414 = 15,704 Btuh

To calculate kW at 208 v, see Wattage Multiplication Factors table on page 19.

Total unit heating capacity is 31,004 Btuh (15,300 + 15,704).

IV Determine fan speed and power requirements at design conditions.

Before entering the air delivery tables, calculate the total static pressure required. From the given, the Accessory Electric Heat Pressure Drop table, Wet Coil Pressure Drop table, and the Filter Pressure Drop table, find:

External static pressure	0.40 in. wg
Filter	0.08 in. wg
Electric heat	0.04 in. wg
Wet coil	0.06 in. wg
Total static pressure	0.58 in. wg

Enter the table for Dry Coil Air Delivery — Horizontal and Vertical Discharge at 1125 cfm and 230 V high speed. By interpolation, the standard motor will deliver 0.66 in. wg static pressure. This will adequately handle job requirements.

Performance data

NET COOLING CAPACITIES (cont)

50HX024-311 (2 TONS)

Temp (F) Outdoor Ent Air		Indoor Air—Cfm/Bypass Factors—BF											
		700/0.04				800/0.04				900/0.05			
		Indoor Air — Ewb (F)											
		72	67	63*	62	72	67	63*	62	72	67	63*	62
85	TC	26.5	23.9	22.0	21.1	26.7	24.1	22.3	21.6	26.8	24.3	22.6	22.0
	SHC	12.5	16.2	15.7	19.5	12.9	17.1	16.7	20.8	13.3	17.9	17.7	22.0
	kW	2.05	2.04	2.04	2.03	2.09	2.08	2.08	20.7	2.13	2.11	2.11	2.11
95	TC	25.9	22.9	21.0	20.1	26.0	23.4	21.3	20.6	26.0	23.5	21.5	21.1
	SHC	12.5	15.9	15.3	19.0	12.9	16.9	16.3	20.1	13.3	17.9	17.3	21.1
	kW	2.25	2.24	2.22	2.22	2.29	2.28	2.27	2.27	2.32	2.31	2.31	2.31
105	TC	24.7	21.6	19.6	18.7	25.0	21.9	19.9	19.4	25.3	22.1	20.1	20.1
	SHC	12.1	15.4	14.7	18.3	12.7	16.5	15.7	19.2	13.3	17.5	16.7	20.1
	kW	2.46	2.45	2.42	2.42	2.50	2.49	2.47	2.47	2.54	2.53	2.51	2.51
115	TC	23.2	20.0	17.9	17.3	23.6	20.3	18.2	18.1	23.9	20.5	18.4	18.8
	SHC	11.6	14.8	14.0	17.3	12.3	15.9	15.0	18.1	12.9	17.0	16.0	18.8
	kW	2.70	2.67	2.64	2.64	2.74	2.71	2.69	2.69	2.78	2.75	2.73	2.74

50HX024-321

Temp (F) Outdoor Ent Air		Indoor Air—Cfm/Bypass Factors—BF											
		700/0.04				800/0.04				900/0.05			
		Indoor Air — Ewb (F)											
		72	67	63*	62	72	67	63*	62	72	67	63*	62
85	TC	25.6	23.9	22.0	21.6	25.6	24.2	22.4	22.6	25.5	24.3	22.6	23.2
	SHC	12.4	16.2	15.5	19.4	12.8	17.3	16.6	20.3	13.1	18.3	17.7	20.9
	kW	2.0	2.0	1.9	2.0	2.1	2.0	2.0	2.0	2.2	2.1	2.1	2.1
95	TC	25.1	22.6	20.9	20.8	25.3	23.0	21.2	21.5	25.3	23.2	21.3	22.1
	SHC	12.4	15.8	15.1	18.6	13.0	17.0	16.1	19.4	13.4	18.1	17.2	20.0
	kW	2.2	2.2	2.1	2.1	2.3	2.2	2.2	2.2	2.4	2.3	2.3	2.3
105	TC	23.8	21.4	19.7	19.9	24.1	21.7	20.0	20.6	24.2	21.8	20.1	21.1
	SHC	12.0	15.3	14.6	17.8	12.6	16.5	15.7	18.6	13.3	17.6	16.7	19.1
	kW	2.5	2.4	2.3	2.3	2.5	2.5	2.4	2.4	2.6	2.5	2.5	2.5
115	TC	22.5	20.1	18.4	18.7	22.7	20.4	18.6	19.6	22.8	20.5	18.8	20.1
	SHC	11.5	14.9	14.1	16.9	12.2	16.0	15.2	17.5	12.8	17.2	16.2	18.1
	kW	2.7	2.6	2.5	2.5	2.8	2.7	2.6	2.6	2.8	2.7	2.7	2.7

50HX030 (2-1/2 TONS)

Temp (F) Outdoor Ent Air		Indoor Air—Cfm/Bypass Factors—BF											
		875/0.04				1000/0.05				1125/0.06			
		Indoor Air — Ewb (F)											
		72	67	63*	62	72	67	63*	62	72	67	63*	62
85	TC	32.5	29.4	27.0	25.7	33.2	29.8	27.5	26.2	33.2	30.1	27.9	27.0
	SHC	15.4	19.9	19.3	23.8	16.2	21.1	20.5	25.5	16.6	22.3	21.7	27.0
	kW	2.61	2.58	2.56	2.55	2.67	2.63	2.62	2.61	2.72	2.68	2.66	2.66
95	TC	31.5	28.2	25.1	23.9	31.9	28.6	25.9	24.8	31.9	28.8	26.5	26.0
	SHC	15.2	19.5	18.5	22.9	15.8	20.7	19.9	24.6	16.2	21.9	21.2	26.0
	kW	2.85	2.81	2.78	2.77	2.90	2.86	2.83	2.83	2.94	2.91	2.89	2.89
105	TC	30.1	26.8	23.4	22.3	30.5	27.2	23.8	23.4	30.8	27.4	24.6	24.7
	SHC	14.7	19.0	17.8	22.1	15.3	20.3	19.1	23.4	16.1	21.4	20.5	24.7
	kW	3.09	3.06	3.02	3.01	3.14	3.11	3.07	3.07	3.20	3.16	3.13	3.13
115	TC	28.8	24.8	22.6	21.8	29.1	25.1	21.5	21.9	29.3	25.9	21.7	22.8
	SHC	14.3	18.3	17.4	21.7	15.0	19.6	18.1	21.9	15.6	21.0	19.3	22.8
	kW	3.37	3.32	3.27	3.27	2.42	3.38	3.33	3.34	3.47	3.44	3.38	3.41

See Legend and Notes on page 15.

Performance data (cont)

NET COOLING CAPACITIES (cont)

50HX036 (3 TONS)

Temp (F) Outdoor Ent Air		Indoor Air—Cfm/Bypass Factors—BF															
		1050.0/0.02				1150/0.02				1200/0.03				1350/0.03			
		Indoor Air — Ewb (F)															
		72	67	63*	62	72	67	63*	62	72	67	63*	62	72	67	63*	62
85	TC	40.4	36.4	33.7	32.4	40.8	36.8	34.1	32.7	41.1	37.0	34.2	32.9	41.4	37.3	34.6	33.4
	SHC	19.0	24.7	24.0	29.8	19.9	25.8	25.1	31.3	20.3	26.4	25.6	31.9	21.5	27.9	27.1	33.3
	kW	3.23	2.18	3.15	3.14	3.27	3.22	3.19	3.18	3.30	3.25	3.22	3.20	3.36	3.31	3.28	3.26
95	TC	38.7	34.9	32.1	30.8	38.9	35.0	32.5	31.1	39.2	35.3	32.6	31.3	39.5	35.6	32.9	32.3
	SHC	18.6	24.1	23.4	29.1	19.4	25.2	24.5	30.6	19.9	25.8	25.0	31.2	21.1	27.4	26.5	32.3
	kW	3.54	3.49	3.46	3.45	3.58	3.53	3.51	3.49	3.60	3.55	3.52	3.51	3.67	3.62	3.59	3.58
105	TC	37.5	33.2	30.5	29.2	37.2	33.5	30.8	29.6	37.3	33.6	30.9	30.0	37.6	33.9	31.1	31.0
	SHC	18.3	23.6	22.7	28.4	18.9	24.6	23.8	29.6	19.4	25.2	24.3	30.0	20.6	26.8	25.9	31.0
	kW	3.89	3.82	3.79	3.78	3.93	3.87	3.83	3.83	3.95	3.89	3.86	3.85	4.01	3.95	3.92	3.91
115	TC	35.6	31.4	28.9	27.7	35.9	31.7	29.1	28.4	35.3	31.8	29.2	28.8	35.5	32.0	29.4	29.6
	SHC	17.7	22.9	22.1	27.6	18.4	24.1	23.1	28.4	18.9	24.6	23.6	28.7	20.2	26.2	25.1	29.6
	kW	4.25	4.19	4.14	4.13	4.30	4.23	4.19	4.19	4.31	4.25	4.21	4.22	4.38	4.32	4.28	4.29

50HX042 (3-1/2 TONS)

Temp (F) Outdoor Ent Air		Indoor Air—Cfm/Bypass Factors—BF											
		1225/0.09				1400/0.10				1575/0.11			
		Indoor Air — Ewb (F)											
		72	67	63*	62	72	67	63*	62	72	67	63*	62
85	TC	46.1	42.6	39.7	38.9	46.6	43.2	40.4	39.8	47.4	43.7	40.9	40.5
	SHC	22.9	29.5	28.8	35.7	23.7	31.2	30.6	38.0	24.8	32.7	32.2	39.9
	kW	3.72	3.67	3.64	3.63	3.80	3.75	3.72	3.71	3.88	3.82	3.79	3.79
95	TC	44.3	40.9	37.9	37.3	44.8	41.5	38.6	3.81	45.5	41.9	39.1	38.8
	SHC	22.3	28.9	28.1	34.8	23.1	30.6	29.8	37.0	24.2	32.3	31.4	38.7
	kW	4.08	4.03	4.00	3.98	4.16	4.11	4.08	4.06	4.24	4.18	4.15	4.15
105	TC	42.5	39.1	36.2	35.6	43.0	39.6	36.7	36.4	43.1	40.0	37.2	37.3
	SHC	21.7	28.2	27.3	33.9	22.5	29.9	29.0	35.9	23.2	31.5	30.5	37.3
	kW	4.48	4.43	4.39	4.37	4.56	4.50	4.47	4.46	4.63	4.58	4.54	4.55
115	TC	40.6	37.2	34.3	33.8	41.0	37.7	34.8	34.7	41.2	38.0	35.2	35.7
	SHC	21.1	27.5	26.5	32.9	21.9	29.3	28.2	34.6	22.7	30.9	29.8	35.6
	kW	4.93	4.87	4.82	4.80	5.01	4.95	4.90	4.89	5.08	5.02	4.98	4.99

50HX048-301 (4 TONS)

Temp (F) Outdoor Ent Air		Indoor Air—Cfm/Bypass Factors—BF											
		1400/0.05				1600/0.05				1800/0.06			
		Indoor Air — Ewb (F)											
		72	67	63*	62	72	67	63*	62	72	67	63*	62
85	TC	54.2	49.0	45.4	44.1	55.1	49.8	46.2	45.1	55.8	50.5	46.8	46.2
	SHC	26.9	34.3	33.3	41.4	28.3	36.6	35.5	44.2	29.7	38.8	37.7	46.1
	kW	4.25	4.18	4.14	4.13	4.31	4.24	4.20	4.19	4.38	4.31	4.26	4.26
95	TC	51.9	46.8	43.1	41.9	52.8	47.5	43.8	43.1	53.2	48.1	44.3	44.4
	SHC	26.2	33.5	32.4	40.3	27.6	35.8	34.6	43.0	28.9	38.1	36.7	44.4
	kW	4.71	4.64	4.60	4.58	4.78	4.70	4.66	4.64	4.83	4.77	4.72	4.71
105	TC	49.5	44.4	40.8	39.7	50.2	45.1	41.4	41.1	50.8	45.6	41.8	42.4
	SHC	25.4	32.7	31.4	39.2	26.8	35.0	33.6	41.1	28.1	37.3	35.7	42.4
	kW	5.21	5.13	5.09	5.07	5.27	5.19	5.15	5.15	5.34	5.26	5.22	5.23
115	TC	46.9	41.8	38.4	37.6	47.6	42.4	38.9	39.1	48.0	42.8	39.3	40.3
	SHC	24.7	31.7	30.4	37.6	26.0	34.0	32.6	39.1	27.3	36.2	34.6	40.3
	kW	5.77	5.67	5.60	5.59	5.84	5.74	5.67	5.68	5.90	5.80	5.74	5.77

See Legend and Notes on page 15.

Performance data (cont)

NET COOLING CAPACITIES (cont)

50HX048-311

Temp (F) Outdoor Ent Air		Indoor Air—Cfm/Bypass Factors—BF											
		1400/0.05				1550/0.05				1800/0.06			
		Indoor Air — Ewb (F)											
		72	67	63*	62	72	67	63*	62	72	67	63*	62
85	TC	49.4	46.4	44.0	43.5	49.7	46.8	44.4	43.9	49.9	47.0	44.7	44.2
	SHC	25.5	32.2	31.8	38.9	26.0	33.1	32.7	40.2	26.7	34.3	34.0	42.1
	kW	3.9	3.8	3.7	3.7	4.0	3.9	3.8	3.8	4.1	4.0	3.9	3.9
95	TC	48.8	45.7	43.0	42.5	49.2	46.0	43.4	42.9	49.5	46.4	43.8	43.2
	SHC	25.6	32.5	31.9	39.1	26.2	33.5	32.9	40.6	26.9	34.9	34.4	42.3
	kW	4.4	4.2	4.1	4.1	4.4	4.3	4.2	4.1	4.6	4.4	4.3	4.3
105	TC	47.9	44.4	41.3	40.6	48.2	44.7	41.7	41.1	48.5	45.0	42.4	41.9
	SHC	25.6	32.5	31.3	38.5	26.2	33.6	32.5	40.1	27.0	35.2	34.5	42.3
	kW	4.8	4.6	4.5	4.5	4.9	4.7	4.6	4.6	5.0	4.9	4.7	4.7
115	TC	46.2	42.0	39.1	38.3	46.5	42.3	41.7	41.1	48.5	45.0	42.4	41.9
	SHC	25.4	31.6	30.2	37.2	26.2	32.9	32.5	40.1	27.0	35.2	34.5	42.3
	kW	5.4	5.1	4.9	4.9	5.5	5.2	4.6	4.6	5.0	4.9	4.7	4.7

50HX060 (5 TONS)

Temp (F) Outdoor Ent Air		Indoor Air—Cfm/Bypass Factors—BF											
		1800/0.03				2000/0.04				2250/0.04			
		Indoor Air — Ewb (F)											
		72	67	63*	62	72	67	63*	62	72	67	63*	62
85	TC	66.8	60.0	55.7	54.1	67.5	60.7	56.3	55.4	68.2	61.2	56.8	57.1
	SHC	34.3	44.2	42.6	53.3	35.8	46.7	45.0	55.4	37.7	49.7	47.8	57.1
	kW	5.94	5.71	5.56	5.53	6.04	5.80	5.65	5.64	6.14	5.91	5.75	5.78
95	TC	63.5	57.0	52.8	51.6	64.1	57.5	53.4	53.1	64.6	58.0	53.8	54.6
	SHC	33.2	43.0	41.5	51.6	34.7	45.5	43.8	53.1	36.5	48.4	46.5	54.6
	kW	6.50	6.27	6.10	6.08	6.60	6.35	6.19	6.20	6.70	6.46	6.29	6.34
105	TC	60.0	53.9	49.9	49.3	60.5	54.2	50.3	50.7	61.0	54.6	50.7	52.1
	SHC	32.1	41.8	40.3	49.3	33.5	44.2	42.5	50.7	35.3	47.2	45.3	52.1
	kW	7.13	6.88	6.70	6.70	7.22	6.96	6.79	6.83	7.33	7.07	6.89	6.97
115	TC	56.4	50.6	46.9	47.1	57.0	51.0	47.3	48.2	57.3	51.3	47.6	49.5
	SHC	30.9	40.6	39.2	47.0	32.4	43.0	41.3	48.2	34.2	46.0	44.0	49.5
	kW	7.79	7.52	7.33	7.37	7.89	7.62	7.42	7.50	8.00	7.72	7.53	7.64

LEGEND
BF —Bypass Factor
Edb —Entering Dry-Bulb
Ewb —Entering Wet-Bulb
kW —Total Unit Power Input
Ldb —Leaving Dry-Bulb
Lwb —Leaving Wet-Bulb
SHC —Sensible Heat Capacity (1000 Btuh) Net
TC —Total Capacity (1000 Btuh) Net

*At 75°F entering dry bulb (Tennessee Valley Authority [TVA] rating conditions); all others at 80°F entering dry bulb.

NOTES:
1. Direct interpolation is permissible. Do not extrapolate.
2. The following formulas may be used:

$$^{t}ldb = {}^{t}edb - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

^{t}edb = Wet-bulb temperature corresponding to enthalpy of air leaving indoor coil (h_{lwb})

$$^{h}lwb = {}^{h}ewb - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where: ^{h}ewb = Enthalpy of air entering indoor coil

3. The SHC is based on 80°F edb temperature of air entering indoor coil.
   Below 80°F edb, subtract (corr factor x cfm) from SHC.
   Above 80°F edb, add (corr factor x cfm) to SHC.
   Correction Factor = 1.10 x (1 – BF) x (edb – 80).

Performance data (cont)

HEATING CAPACITIES

50HX024-311

Cfm (Std Air)	Return Air (F db)		Temperature Air Entering Outdoor Coil (F db at 70% rh)																	
			–10		0		10		17		20		30		40		47		50		60		70	
700	60	Cap.	8.8	8.2	10.9	10.0	12.9	11.8	14.5	13.2	15.2	13.8	17.9	15.7	20.9	20.9	23.4	23.4	24.1	14.1	26.2	26.2	28.6	28.6
		kW	1.58		1.63		1.68		1.72		1.73		1.79		1.87		1.95		1.97		2.03		2.11	
	70	Cap.	8.6	7.9	10.6	9.8	12.7	11.6	14.2	13.0	14.9	13.5	17.5	15.4	20.4	20.4	23.0	23.0	23.6	23.6	26.2	26.2	29.0	29.0
		kW	1.70		1.76		1.81		1.85		1.87		1.94		2.03		2.12		2.14		2.23		2.34	
	80	Cap.	8.1	7.5	10.3	9.5	12.5	11.5	14.0	12.8	14.7	13.3	17.2	15.1	20.0	20.0	22.5	22.5	23.2	23.2	26.4	26.4	28.7	28.7
		kW	1.82		1.89		1.97		2.01		2.04		2.11		2.20		2.30		2.33		2.46		2.56	
800	60	Cap.	9.0	8.3	11.0	10.1	13.1	12.0	14.7	13.4	15.4	14.0	18.2	15.9	21.1	21.1	23.4	23.4	23.9	23.9	26.7	26.7	27.8	27.8
		kW	1.60		1.64		1.69		1.72		1.73		1.79		1.86		1.92		1.94		2.02		2.03	
	70	Cap.	8.7	8.0	10.8	9.9	12.8	11.8	14.4	13.1	15.1	13.7	17.7	15.5	20.6	20.6	23.2	23.2	23.8	23.8	26.1	26.1	28.1	28.1
		kW	1.72		1.77		18.2		1.85		1.87		1.93		2.01		2.09		2.11		2.18		2.24	
	80	Cap.	8.3	7.7	10.5	9.6	12.6	11.6	14.2	12.9	14.8	13.5	17.4	15.2	20.2	20.2	22.7	22.7	23.5	23.5	26.2	26.2	28.6	28.6
		kW	1.84		1.90		1.97		2.01		2.03		2.09		2.18		2.27		2.30		2.40		2.48	
900	60	Cap.	9.1	8.4	11.1	10.3	13.2	12.1	14.8	13.5	15.6	14.2	18.3	16.1	21.3	21.3	22.9	22.9	23.3	23.3	25.7	25.7	27.1	27.1
		kW	1.63		1.66		1.70		1.73		1.74		1.79		1.87		1.90		1.91		1.97		1.99	
	70	Cap.	8.8	8.2	10.9	10.0	13.0	11.9	14.5	13.2	15.3	13.8	17.9	15.7	20.8	20.8	23.2	23.2	23.3	23.3	25.6	25.6	28.0	28.0
		kW	1.74		1.78		1.83		1.86		1.88		1.93		2.01		2.07		2.08		2.14		2.20	
	80	Cap.	8.5	7.8	10.6	9.8	12.8	11.7	14.3	13.0	15.0	13.6	17.6	15.4	20.4	20.4	22.9	22.9	23.4	23.4	25.9	25.9	28.2	28.2
		kW	1.86		1.92		1.97		2.01		2.03		2.09		2.17		2.25		2.27		2.35		2.42	

50HX024-321

Cfm (Std Air)	Return Air (F db)		Temperature Air Entering Outdoor Coil (F db at 70% rh)																	
			–10		0		10		17		20		30		40		47		50		60		70	
700	60	Cap.	7.65	7.08	9.55	8.79	11.56	10.61	13.04	11.89	13.93	12.63	16.89	14.80	20.37	20.37	23.27	23.27	24.37	24.37	28.31	28.31	29.77	29.77
		kW	1.52		1.59		1.65		1.70		1.72		1.78		1.84		1.90		1.93		2.04		2.08	
	70	Cap.	7.10	6.56	9.00	8.28	11.16	10.24	12.75	11.62	13.57	12.30	16.66	14.59	20.04	20.04	22.86	22.86	23.89	23.89	27.71	27.71	29.38	29.38
		kW	1.66		1.76		1.82		1.88		1.90		1.97		2.04		2.10		2.13		2.25		2.30	
	80	Cap.	5.19	4.80	8.43	7.76	10.64	9.77	12.25	11.17	13.14	11.92	16.36	14.33	19.79	19.79	22.53	22.53	23.47	23.47	27.11	27.11	31.49	31.49
		kW	1.77		1.91		1.99		2.06		2.08		2.17		2.25		2.32		2.35		2.48		2.64	
800	60	Cap.	7.81	7.23	8.80	8.10	11.80	10.83	13.26	12.09	14.14	12.82	17.13	15.01	20.67	23.60	23.60	23.60	24.74	24.74	28.76	28.76	30.78	30.78
		kW	1.58		1.59		1.67		1.72		1.74		1.79		1.84		1.89		1.92		2.01		2.06	
	70	Cap.	7.34	6.79	9.26	8.52	11.41	10.47	13.00	11.85	13.83	12.54	16.82	14.74	20.34	20.34	23.20	23.20	24.26	24.26	28.13	28.13	29.76	29.76
		kW	1.70		1.80		1.84		1.90		1.92		1.98		2.04		2.09		2.12		2.22		2.27	
	80	Cap.	5.43	5.02	8.79	8.09	10.93	10.04	12.58	11.47	13.41	12.16	16.63	14.57	20.06	20.06	22.86	22.86	23.80	23.80	27.57	27.57	32.13	32.13
		kW	1.82		1.93		2.02		2.08		2.10		2.18		2.25		2.30		2.33		2.45		2.59	
900	60	Cap.	8.06	7.45	9.96	9.16	12.04	11.05	13.49	12.30	14.13	12.81	17.38	15.23	20.97	20.97	23.96	23.96	25.07	25.07	29.22	29.22	30.58	30.58
		kW	1.62		1.66		1.72		1.76		1.84		1.82		1.87		1.91		1.93		2.02		2.05	
	70	Cap.	7.60	7.03	9.52	8.76	11.67	10.71	13.26	12.09	14.10	12.78	17.12	15.00	20.64	20.64	23.54	23.54	24.62	24.62	28.57	28.57	30.15	30.15
		kW	1.76		1.84		1.89		1.93		1.95		2.01		2.06		2.10		2.13		2.22		2.27	
	80	Cap.	6.96	6.43	8.99	8.27	11.21	10.29	12.82	11.69	13.70	12.42	16.92	14.82	20.31	20.31	23.16	23.16	24.16	24.16	27.97	27.97	32.66	32.66
		kW	1.88		2.00		2.07		2.12		2.14		2.21		2.27		2.32		2.35		2.45		2.58	

LEGEND

Cap. — Heating Capacity (1000 Btuh) (Includes Indoor-Fan Motor Heat)
db — Dry Bulb
kW — Total Power Input (Includes Compressor Motor Power Input, Outdoor-Fan Motor Input, and Indoor-Fan Motor Input)
rh — Relative Humidity

NOTES:

1. ▭ indicates integrated ratings.
2. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it.

Performance data (cont)

HEATING CAPACITIES

50HX030 (2-1/2 TONS)

Cfm (Std Air)	Return Air (F db)		Temperature Air Entering Outdoor Coil (F db at 70% rh)										
			–10	0	10	17	20	30	40	47	50	60	70
875	60	Cap.	7.8 | 6.8	12.3 | 10.1	14.5 | 13.1	17.1 | 15.6	18.2 | 16.4	21.8 | 19.1	25.7 | 24.6	28.4 | 28.4	29.3 | 29.3	32.1 | 32.1	35.0 | 35.0
		kW	2.10	2.13	2.15	2.19	2.20	2.25	2.31	2.36	2.37	2.42	2.47
	70	Cap.	6.8 | 5.9	10.1 | 9.0	13.3 | 12.1	16.0 | 14.6	17.1 | 15.5	21.0 | 18.4	25.0 | 24.0	27.9 | 27.9	28.7 | 28.7	31.6 | 31.6	34.5 | 34.5
		kW	2.25	2.32	2.37	2.40	2.42	2.48	2.57	2.63	2.65	2.72	2.79
	80	Cap.	3.9 | 3.3	8.8 | 7.8	13.8 | 12.5	17.7 | 16.1	18.6 | 16.8	21.9 | 19.2	25.3 | 24.2	27.6 | 27.6	28.4 | 28.4	31.1 | 31.1	33.7 | 33.7
		kW	2.50	2.55	2.60	2.72	2.74	2.82	2.90	2.96	2.98	3.04	3.11
1000	60	Cap.	9.7 | 6.7	11.1 | 9.9	14.0 | 12.7	16.6 | 15.2	17.8 | 16.1	21.9 | 19.2	25.9 | 24.8	28.7 | 28.7	29.6 | 29.6	32.5 | 32.5	35.5 | 35.5
		kW	2.10	2.11	2.15	2.17	2.18	2.23	2.28	2.31	2.32	2.35	2.39
	70	Cap.	7.0 | 6.0	9.9 | 8.8	12.9 | 11.7	15.4 | 14.0	16.7 | 15.0	21.0 | 18.4	25.2 | 24.2	28.2 | 28.2	29.1 | 29.1	32.1 | 32.1	35.0 | 35.0
		kW	2.25	2.30	2.35	2.37	2.39	2.46	2.53	2.58	2.59	2.64	2.69
	80	Cap.	3.6 | 3.0	8.8 | 7.8	14.0 | 12.6	18.0 | 16.4	19.0 | 17.1	22.2 | 19.5	25.6 | 24.5	28.0 | 28.0	28.7 | 28.7	31.3 | 31.3	33.8 | 33.8
		kW	2.50	2.55	2.60	2.72	2.73	2.79	2.85	2.89	2.91	2.95	2.99
1125	60	Cap.	7.1 | 6.2	10.8 | 9.6	14.1 | 12.1	16.9 | 15.4	18.1 | 16.3	22.2 | 19.4	26.2 | 25.1	29.0 | 29.0	29.8 | 29.8	32.6 | 32.6	35.3 | 35.3
		kW	2.10	2.11	2.17	2.19	2.20	2.23	2.27	2.29	2.30	2.31	2.33
	70	Cap.	6.4 | 5.5	9.7 | 8.6	13.0 | 11.7	15.7 | 14.3	16.9 | 15.3	21.2 | 18.6	25.5 | 24.4	28.5 | 28.5	29.3 | 29.3	32.3 | 32.3	35.2 | 35.2
		kW	2.25	2.30	2.35	2.39	2.40	2.45	2.51	2.55	2.56	2.59	2.62
	80	Cap.	3.9 | 3.3	9.1 | 8.1	13.9 | 12.5	18.3 | 16.7	19.3 | 17.4	22.6 | 19.8	25.9 | 24.7	28.2 | 28.2	29.0 | 29.0	31.5 | 31.5	34.0 | 34.0
		kW	2.50	2.55	2.00	2.72	2.74	2.78	2.82	2.86	2.86	2.89	2.92

50HX036 (3 TONS)

Cfm (Std Air)	Return Air (F db)		Temperature Air Entering Outdoor Coil (F db at 70% rh)										
			–10	0	10	17	20	30	40	47	50	60	70
1050	60	Cap.	8.9 | 8.3	12.1 | 11.3	15.6 | 14.8	18.2 | 16.7	19.8 | 17.9	23.8 | 20.8	29.0 | 29.0	33.5 | 33.5	35.7 | 35.7	40.8 | 40.8	44.8 | 44.8
		kW	2.18	2.27	2.37	2.43	2.46	2.55	2.71	2.81	2.83	2.92	2.98
	70	Cap.	8.8 | 8.3	11.9 | 11.1	15.3 | 14.5	17.8 | 16.4	19.4 | 17.6	23.3 | 20.5	28.3 | 28.3	32.8 | 32.8	35.0 | 35.0	40.1 | 40.1	44.2 | 44.2
		kW	2.37	2.48	2.58	2.65	2.69	2.79	2.96	3.07	3.10	3.20	3.27
	80	Cap.	8.7 | 8.2	11.7 | 10.9	15.1 | 14.4	17.6 | 16.1	19.1 | 17.3	22.9 | 20.0	27.7 | 27.7	32.1 | 32.1	34.3 | 34.3	39.6 | 39.6	44.0 | 44.0
		kW	2.56	2.69	2.81	2.89	2.93	3.05	3.23	3.36	3.39	3.52	3.61
1150	60	Cap.	8.9 | 8.3	12.1 | 11.3	15.6 | 14.9	18.3 | 16.8	19.9 | 18.0	23.9 | 21.0	29.2 | 29.2	33.8 | 33.8	36.0 | 36.0	42.1 | 42.1	45.4 | 45.4
		kW	2.21	2.29	2.37	2.43	2.46	2.54	2.69	2.78	2.80	2.92	2.94
	70	Cap.	8.9 | 8.3	12.1 | 11.3	15.5 | 14.7	18.0 | 18.5	19.5 | 17.7	23.5 | 20.6	28.6 | 28.6	33.0 | 33.0	35.4 | 35.4	40.3 | 40.3	45.7 | 45.7
		kW	2.39	2.49	2.59	2.65	2.68	2.78	2.93	3.04	3.07	3.15	3.26
	80	Cap.	8.7 | 8.2	11.8 | 11.0	15.1 | 14.4	17.7 | 16.2	19.2 | 17.4	23.1 | 20.2	28.0 | 28.0	32.4 | 32.4	34.5 | 34.5	39.7 | 39.7	44.8 | 44.8
		kW	2.59	2.70	2.81	2.89	2.92	3.03	3.21	3.32	3.35	3.46	3.56
1200	60	Cap.	9.0 | 8.4	12.1 | 11.3	15.7 | 15.0	18.4 | 16.9	20.0 | 18.1	24.1 | 21.1	29.4 | 29.4	33.9 | 33.9	36.1 | 36.1	40.9 | 40.9	45.6 | 45.6
		kW	2.22	2.30	2.38	2.43	2.46	2.54	2.68	2.77	2.79	2.87	2.93
	70	Cap.	9.0 | 8.4	12.1 | 11.3	15.6 | 14.7	18.0 | 16.5	19.6 | 17.8	23.6 | 20.6	28.7 | 28.7	33.2 | 33.2	35.4 | 35.4	40.8 | 40.8	44.8 | 44.8
		kW	2.41	2.50	2.59	2.65	2.68	2.77	2.93	3.03	3.05	3.15	3.20
	80	Cap.	8.8 | 8.2	11.9 | 11.1	15.3 | 14.5	17.7 | 16.3	19.3 | 17.5	23.2 | 20.3	28.0 | 28.0	32.5 | 32.5	34.7 | 34.7	39.7 | 39.7	44.7 | 44.7
		kW	2.60	2.70	2.81	2.89	2.92	3.03	3.19	3.30	3.34	3.43	3.53
1350	60	Cap.	9.1 | 8.5	12.4 | 11.6	16.0 | 15.1	18.5 | 17.1	20.2 | 18.4	24.3 | 21.3	29.7 | 29.7	34.2 | 34.2	36.4 | 36.4	40.7 | 40.7	45.4 | 45.4
		kW	2.25	2.33	2.40	2.45	2.47	2.54	2.68	2.76	2.78	2.83	2.89
	70	Cap.	9.0 | 8.4	12.2 | 11.4	15.7 | 14.9	18.3 | 16.8	19.9 | 18.0	23.9 | 20.9	29.0 | 29.0	33.6 | 33.6	35.8 | 35.8	40.6 | 40.6	44.6 | 44.6
		kW	2.44	2.52	2.61	2.66	2.69	2.77	2.91	3.00	3.03	3.10	3.15
	80	Cap.	8.9 | 8.3	12.0 | 11.2	15.4 | 14.6	17.9 | 16.4	19.4 | 17.6	23.4 | 20.6	28.3 | 28.3	32.8 | 32.8	35.2 | 35.2	40.2 | 40.2	44.7 | 44.7
		kW	2.63	2.73	2.83	2.89	2.92	3.02	3.17	3.27	3.30	3.39	3.46

LEGEND

Cap. — Heating Capacity (1000 Btuh) (Includes Indoor-Fan Motor Heat)
db — Dry Bulb
kW — Total Power Input (Includes Compressor Motor Power Input, Outdoor-Fan Motor Input, and Indoor-Fan Motor Input)
rh — Relative Humidity

NOTES:

1. ▭ indicates integrated ratings.
2. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it.

Performance data (cont)

HEATING CAPACITIES

50HX042 (3-1/2 TONS)

Cfm (Std Air)	Return Air (F db)		Temperature Air Entering Outdoor Coil (F db at 70% rh)										
			–10	0	10	17	20	30	40	47	50	60	70
1250	60	Cap.	9.9 | 9.2	14.1 | 13.0	18.4 | 16.8	21.4 | 19.5	23.1 | 20.8	28.7 | 25.2	35.6 | 34.1	40.4 | 40.4	42.5 | 42.5	49.6 | 49.6	56.7 | 56.7
		kW	2.77	2.85	2.92	2.98	3.00	3.10	3.21	3.29	3.32	3.42	3.53
	70	Cap.	9.1 | 8.5	13.4 | 12.3	17.7 | 16.2	20.7 | 18.9	22.4 | 20.2	28.1 | 24.6	34.9 | 33.5	39.6 | 39.6	41.7 | 41.7	48.4 | 48.4	55.2 | 55.2
		kW	2.97	3.06	3.16	3.23	3.26	3.38	3.50	3.59	3.62	3.73	3.84
	80	Cap.	8.0 | 7.5	12.5 | 11.5	16.9 | 15.4	20.0 | 18.2	21.7 | 19.5	27.4 | 24.0	34.2 | 32.8	39.0 | 39.0	41.1 | 41.1	48.1 | 48.1	55.1 | 55.1
		kW	3.16	3.29	3.41	3.50	3.54	3.68	3.83	3.93	3.97	4.11	4.24
1400	60	Cap.	9.7 | 9.0	14.1 | 13.0	18.6 | 17.0	21.7 | 19.8	23.4 | 21.1	29.0 | 25.4	36.0 | 34.5	40.8 | 40.8	42.9 | 42.9	49.9 | 49.9	56.8 | 56.8
		kW	2.80	2.87	2.94	2.99	3.01	3.09	3.19	3.26	3.28	3.37	3.45
	70	Cap.	8.9 | 8.3	13.4 | 12.3	17.9 | 16.3	21.0 | 19.1	22.7 | 20.5	28.5 | 24.9	35.2 | 33.8	40.0 | 40.0	42.0 | 42.0	48.8 | 48.8	55.7 | 55.7
		kW	3.00	3.09	3.17	3.23	3.26	3.36	3.47	3.55	3.58	3.67	3.77
	80	Cap.	7.9 | 7.3	12.4 | 11.4	17.0 | 15.6	20.3 | 18.5	22.0 | 19.8	27.7 | 24.3	34.5 | 33.1	39.3 | 39.3	41.4 | 41.4	48.5 | 48.5	55.5 | 55.5
		kW	3.20	3.31	3.43	3.51	3.54	3.66	3.79	3.88	3.91	4.03	4.14
1575	60	Cap.	9.9 | 9.2	14.4 | 13.2	18.8 | 17.2	22.0 | 20.0	23.7 | 21.3	29.3 | 25.7	36.3 | 34.8	41.2 | 41.2	42.7 | 42.7	47.4 | 47.4	52.2 | 52.2
		kW	2.86	2.92	2.98	3.02	3.04	3.11	3.19	3.25	3.26	3.29	3.31
	70	Cap.	9.1 | 8.5	13.6 | 12.5	18.1 | 16.6	21.3 | 19.4	23.0 | 20.7	28.8 | 25.2	35.6 | 34.2	40.4 | 40.4	42.5 | 42.5	49.2 | 49.2	56.0 | 56.0
		kW	3.05	3.13	3.20	3.26	3.28	3.37	3.47	3.53	3.56	3.63	3.71
	80	Cap.	8.1 | 7.6	12.7 | 11.7	17.3 | 15.8	20.5 | 18.7	22.3 | 20.1	28.1 | 24.6	34.9 | 33.5	39.7 | 39.7	41.7 | 41.7	48.4 | 48.4	55.1 | 55.1
		kW	3.25	3.35	3.45	3.52	3.56	3.66	3.77	3.85	3.88	3.97	4.05

50HX048-301 (4 TONS)

Cfm (Std Air)	Return Air (F db)		Temperature Air Entering Outdoor Coil (F db at 70% rh)										
			–10	0	10	17	20	30	40	47	50	60	70
1400	60	Cap.	11.9 | 11.1	16.3 | 15.0	20.7 | 19.0	23.8 | 21.7	25.6 | 23.1	31.6 | 27.7	39.2 | 37.6	44.5 | 44.5	46.8 | 46.8	54.4 | 54.4	62.1 | 62.1
		kW	3.05	3.09	3.13	3.16	3.18	3.24	3.33	3.40	3.42	3.51	3.60
	70	Cap.	11.4 | 10.6	15.8 | 14.6	20.3 | 18.6	23.4 | 21.4	25.2 | 22.7	31.0 | 27.1	38.4 | 36.8	43.6 | 43.6	46.0 | 46.0	53.9 | 53.9	61.8 | 61.8
		kW	3.32	3.38	3.44	3.48	3.51	3.58	3.69	3.76	3.80	3.90	4.02
	80	Cap.	10.6 | 9.8	15.2 | 14.0	19.8 | 18.1	23.0 | 21.0	24.7 | 22.3	30.4 | 26.6	37.7 | 36.1	42.7 | 42.7	45.2 | 45.2	53.3 | 53.3	61.4 | 61.4
		kW	3.59	3.68	3.77	3.84	3.86	3.95	4.08	4.16	4.20	4.34	4.47
1600	60	Cap.	12.0 | 11.2	16.5 | 15.2	20.9 | 19.2	24.1 | 21.9	25.9 | 23.3	31.8 | 27.9	39.5 | 37.9	44.8 | 44.8	46.9 | 46.9	53.7 | 53.7	60.5 | 60.5
		kW	3.06	3.09	3.12	3.14	3.15	3.20	3.27	3.33	3.34	3.39	3.44
	70	Cap.	11.6 | 10.8	16.0 | 14.8	20.5 | 18.7	23.6 | 21.5	25.4 | 22.9	31.2 | 27.4	38.7 | 37.1	44.0 | 44.0	46.4 | 46.4	54.2 | 54.2	62.1 | 62.1
		kW	3.33	3.38	3.42	3.45	3.47	3.53	3.62	3.68	3.71	3.79	3.88
	80	Cap.	10.8 | 10.0	15.4 | 14.1	20.0 | 18.3	23.2 | 21.1	24.9 | 22.5	30.6 | 26.8	38.0 | 36.4	43.1 | 43.1	45.6 | 45.6	53.7 | 53.7	61.8 | 61.8
		kW	3.60	3.68	3.75	3.80	3.82	3.90	4.00	4.07	4.10	4.21	4.32
1800	60	Cap.	12.2 | 11.3	16.6 | 15.3	21.1 | 19.3	24.2 | 22.1	26.0 | 23.5	32.1 | 28.1	39.7 | 38.1	45.1 | 45.1	46.9 | 46.9	53.1 | 53.1	59.3 | 59.3
		kW	3.08	3.10	3.12	3.13	3.14	3.17	3.24	3.28	3.29	3.32	3.36
	70	Cap.	11.7 | 10.9	16.2 | 14.9	20.7 | 18.9	23.8 | 21.7	25.6 | 23.0	31.5 | 27.6	39.0 | 37.4	44.3 | 44.3	46.4 | 46.4	53.4 | 53.4	60.5 | 60.5
		kW	3.35	3.38	3.42	3.44	3.46	3.50	3.58	3.63	3.64	3.69	3.75
	80	Cap.	11.0 | 10.2	15.6 | 14.3	20.1 | 18.4	23.4 | 21.3	25.1 | 22.6	30.9 | 27.0	38.3 | 36.7	43.5 | 43.5	45.8 | 45.8	53.4 | 53.4	61.0 | 61.0
		kW	3.62	3.68	3.74	3.78	3.80	3.86	3.95	4.01	4.03	4.10	4.18

LEGEND

Cap. — Heating Capacity (1000 Btuh) (Includes Indoor-Fan Motor Heat)
db — Dry Bulb
kW — Total Power Input (Includes Compressor Motor Power Input, Outdoor-Fan Motor Input, and Indoor-Fan Motor Input)
rh — Relative Humidity

NOTES:

1. ▭ indicates integrated ratings.
2. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it.

Performance data (cont)

HEATING CAPACITIES

50HX048-311 (4 TONS)

Cfm (Std Air)	Return Air (F db)		Temperature Air Entering Outdoor Coil (F db at 70% rh)																			
			–10		0		10		17		20		30		40		47		50		60		70	
1400	60	Cap.	11.60	10.72	16.08	14.80	21.15	19.41	23.83	21.72	25.37	23.00	31.00	27.17	37.18	37.18	42.01	42.01	43.46	43.46	47.69	47.69	51.66	51.66
		kW	2.55		2.71		2.83		2.92		2.92		3.05		3.24		3.33		3.42		3.63		3.83	
	70	Cap.	10.87	10.05	15.34	14.12	20.50	18.82	23.27	21.22	24.72	22.42	30.35	26.60	36.79	36.79	41.54	41.54	43.29	43.29	48.21	48.21	53.13	53.13
		kW	2.71		2.91		3.06		3.18		3.21		3.31		3.52		3.67		3.72		4.01		4.30	
	80	Cap.	10.19	9.42	14.59	13.42	19.61	18.00	22.47	20.49	23.98	21.75	29.65	25.98	35.77	35.77	40.78	40.78	42.49	42.49	48.02	48.02	53.56	53.56
		kW	2.91		3.09		3.31		3.45		3.49		3.59		3.74		3.94		4.04		4.42		4.80	
1550	60	Cap.	11.89	11.00	16.59	15.26	21.50	19.73	24.22	22.08	25.74	23.35	31.51	27.61	37.66	37.66	42.15	42.15	43.67	43.67	47.58	47.58	51.49	51.49
		kW	2.60		2.77		2.87		2.94		2.95		3.10		3.24		3.33		3.40		3.60		3.77	
	70	Cap.	11.17	10.33	15.87	14.60	20.89	19.18	23.60	21.52	25.12	22.78	31.03	27.19	37.34	37.34	42.00	42.00	43.75	43.75	48.45	48.45	53.15	53.15
		kW	2.78		2.98		3.10		3.22		3.24		3.40		3.55		3.66		3.71		3.97		4.22	
	80	Cap.	10.47	9.68	14.83	13.65	20.07	18.42	22.90	20.88	24.44	22.17	30.13	26.40	36.17	36.17	41.31	41.31	43.07	43.07	48.79	48.79	53.87	53.87
		kW	2.93		3.17		3.35		3.49		3.52		3.62		3.79		3.96		4.05		4.42		4.69	
1800	60	Cap.	12.36	11.43	17.23	15.85	22.10	20.29	24.82	22.63	26.42	23.96	31.98	28.02	38.23	38.23	42.85	42.85	44.10	44.10	47.79	47.79	51.23	51.23
		kW	2.73		2.87		2.97		3.03		3.07		3.20		3.31		3.38		3.42		3.58		3.72	
	70	Cap.	11.63	10.75	16.41	15.10	21.54	19.77	24.22	22.08	25.83	23.43	31.39	27.50	37.71	37.71	42.78	42.78	44.52	44.52	48.96	48.96	53.17	53.17
		kW	2.94		3.08		3.22		3.32		3.33		3.46		3.59		3.70		3.75		3.96		4.15	
	80	Cap.	10.78	9.97	15.45	14.22	20.99	19.27	23.62	21.54	25.15	22.81	30.88	27.06	36.95	36.95	42.13	42.13	43.90	43.90	49.79	49.79	54.49	54.49
		kW	3.15		3.31		3.50		3.60		3.63		3.70		3.88		4.03		4.10		4.32		4.60	

50HX060 (5 TONS)

Cfm (Std Air)	Return Air (F db)		Temperature Air Entering Outdoor Coil (F db at 70% rh)																			
			–10		0		10		17		20		30		40		47		50		60		70	
1800	60	Cap.	15.9	14.8	22.0	20.2	28.0	25.6	32.2	29.4	34.5	31.1	41.9	36.7	51.3	49.1	57.8	57.8	61.2	61.2	72.4	72.4	83.6	83.6
		kW	4.20		4.22		4.24		4.26		4.27		4.29		4.36		4.40		4.43		4.53		4.64	
	70	Cap.	13.9	12.9	20.4	18.8	27.0	24.6	31.5	28.7	33.7	30.4	41.1	36.0	50.2	48.1	56.6	56.6	59.8	59.8	70.8	70.8	81.7	81.7
		kW	4.39		4.49		4.60		4.67		4.68		4.72		4.79		4.83		4.87		4.98		5.09	
	80	Cap.	10.8	1.01	18.0	16.6	25.2	23.1	30.3	27.6	32.6	29.4	40.3	35.3	49.2	47.1	55.4	55.4	58.6	58.6	69.2	69.2	79.8	79.8
		kW	4.41		4.65		4.89		5.06		5.09		5.20		5.27		5.32		5.36		5.47		5.58	
2000	60	Cap.	16.2	15.1	22.2	20.5	28.3	25.8	32.5	29.6	34.7	31.3	42.2	37.0	51.6	49.5	58.3	58.3	61.7	61.7	73.1	73.1	84.5	84.5
		kW	4.24		4.24		4.25		4.25		4.26		4.27		4.32		4.35		4.37		4.45		4.53	
	70	Cap.	14.3	13.3	20.8	19.1	27.3	24.9	31.8	29.0	34.0	30.7	41.4	36.3	50.6	48.5	57.0	57.0	60.3	60.3	71.4	71.4	82.5	82.5
		kW	4.45		4.53		4.60		4.66		4.67		4.69		4.74		4.77		4.80		4.88		4.97	
	80	Cap.	11.2	10.5	18.4	17.0	25.6	23.4	30.7	28.0	33.0	29.7	40.6	35.6	49.6	47.5	55.8	55.8	49.0	59.0	69.8	69.8	80.5	80.5
		kW	4.48		4.70		4.91		5.06		5.08		5.15		5.21		5.24		5.27		5.36		5.44	
2250	60	Cap.	16.5	15.4	22.5	20.7	28.5	26.1	32.7	29.9	35.0	31.6	42.5	37.3	52.1	50.0	58.8	58.8	62.3	62.3	73.8	73.8	85.2	85.2
		kW	4.29		4.28		4.27		4.26		4.26		4.26		4.29		4.31		4.33		4.39		4.45	
	70	Cap.	14.7	13.7	21.2	19.5	27.6	25.2	32.1	29.3	34.3	31.0	41.7	36.6	51.0	48.9	57.5	57.5	60.8	60.8	72.1	72.1	83.3	83.3
		kW	4.52		4.57		4.63		4.66		4.66		4.67		4.70		4.72		4.74		4.81		4.87	
	80	Cap.	11.7	10.9	18.9	17.4	26.1	23.8	31.1	28.3	33.4	30.1	41.0	35.9	50.0	47.9	56.3	56.3	59.5	59.5	70.5	70.5	81.4	81.4
		kW	4.57		4.75		4.94		5.07		5.08		5.12		5.16		5.18		5.20		5.26		5.33	

LEGEND

Cap. — Heating Capacity (1000 Btuh) (Includes Indoor-Fan Motor Heat)
db — Dry Bulb
kW — Total Power Input (Includes Compressor Motor Power Input, Outdoor-Fan Motor Input, and Indoor-Fan Motor Input)
rh — Relative Humidity

NOTES:

1. ▭ indicates integrated ratings.
2. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it.

Performance data (cont)

DRY COIL AIR DELIVERY* — HORIZONTAL AND VERTICAL DISCHARGE (DEDUCT 10% FOR 208 V) — UNITS 024-042

UNIT 50HX	MOTOR SPEED	AIR DELIVERY	230 VOLT HORIZONTAL DISCHARGE										
			External Static Pressure (in.wg)										
			0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
024	Low	Watts	280	275	265	255	250	245	240	—	—	—	—
		Cfm	820	810	755	700	660	600	560	—	—	—	—
	Med	Watts	365	360	350	345	340	330	320	310	300	—	—
		Cfm	1025	1010	975	940	900	850	800	720	630	—	—
	High	Watts	—	—	490	480	470	460	445	430	410	390	380
		Cfm	—	—	1300	1255	1200	1150	1080	1005	915	790	620
030	Low	Watts	—	—	—	—	—	—	—	—	—	—	—
		Cfm	—	—	—	—	—	—	—	—	—	—	—
	Med	Watts	—	365	360	360	350	350					
		Cfm		1060	1020	980	935	880					
	High	Watts					490	485	475	460	450	430	—
		Cfm					1270	1220	1170	1100	1020	920	—
036	Low	Watts	410	400	390	380	370	360	—	—	—	—	—
		Cfm	1275	1240	1195	1150	1095	1040	—	—	—	—	—
	Med	Watts	550	535	520	505	485	470	455	435	415	—	—
		Cfm	1575	1520	1470	1410	1345	1280	1210	1125	1025	—	—
	High	Watts	—	—	—	—	680	655	625	595	570	530	495
		Cfm	—	—	—	—	1720	1625	1530	1430	1320	1190	995
042	Low	Watts	490	480	470	460	450	430	410	390	—	—	—
		Cfm	1400	1380	1340	1300	1250	1200	1140	1070	—	—	—
	Med	Watts	590	580	560	545	525	505	480	450	420	—	—
		Cfm	1600	1560	1540	1470	1430	1360	1300	1220	1120	—	—
	High	Watts	—	—	—	—	—	700	670	640	600	560	500
		Cfm	—	—	—	—	—	1780	1670	1600	1480	1340	1100

* Air delivery values are based on operating voltage of 230 v dry coil, without filter or electric heater. Deduct wet coil, filter, and electric heater pressure drops to obtain external static pressure available for ducting.

NOTES:
1. Do not operate the unit at a cooling airflow that is less than 350 cfm for each 12,000 Btuh of rated cooling capacity. Indoor-coil frosting may occur at airflows below this point.
2. Dashes indicate portions of the table that are beyond the blower motor capacity or are not recommended.

DRY-COIL AIR DELIVERY* — HORIZONTAL AND VERTICAL DISCHARGE FOR INTEGRATED CONTROL MOTOR UNITS AT 230 V — UNITS 048 AND 060

UNIT SIZE 50HX	FAN ONLY (Cfm)	COOLING (Cfm)	HEATING (Cfm)
048	1530	1575	1575
060	1750	1800	2000

* Air delivery values are for dry coil at 230 v. Airflow is independent of external static pressure within ± 5% of table values up to 0.8 in. wg. Air delivery is preset at factory.

NOTE: Do not operate the unit at a cooling airflow that is less than 350 cfm for each 12,0000 Btuh of rated cooling capacity. Indoor coil icing may occur at airflows below this point. Water blow-off may occur at airflows above 450 cfm per 12,000 Btuh of rated cooling capacity.

WET COIL PRESSURE DROP

UNIT SIZE 50HX	AIRFLOW (cfm)	PRESSURE DROP (in. wg)
024	600	0.012
	700	0.022
	800	0.027
	900	0.039
030	900	0.039
	1000	0.057
	1200	0.072
036	1000	0.051
	1200	0.061
	1400	0.068
	1600	0.075
042	1000	0.030
	1200	0.048
	1400	0.057
	1600	0.078
048	1400	0.068
	1550	0.073
	1600	0.075
	1800	0.088
060	1700	0.082
	1900	0.095
	2100	0.108
	2300	0.123

Performance data (cont)

ACCESSORY ELECTRIC HEATER PRESSURE DROP (in. wg)

HEATER kW	CFM								
	600	800	1000	1200	1400	1600	1800	2000	2200
5-20	0.030	0.033	0.037	0.042	0.047	0.052	0.060	0.067	0.075

FILTER PRESSURE DROP (in. wg)

UNIT SIZE 50HX	FILTER SIZE (in.)	CFM																		
		500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
024, 030	24 x 24	—	—	0.06	0.06	0.07	0.07	0.08	0.09	—	—	—	—	—	—	—	—	—	—	—
036-060	24 x 30	—	—	—	—	—	0.07	0.07	0.08	0.08	0.09	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.17	0.18

MINIMUM AIRFLOW (CFM) FOR SAFE ELECTRIC HEATER OPERATION

SIZE					
024	030	036	042	048	060
800	1000	1225	1300	1600	1750

Controls

Sequence of operation

When power is supplied to unit, the transformer (TRAN) is energized.

Cooling — With the thermostat subbase in the cooling position, and when the space temperature comes within 2°F of the cooling set point, the thermostat makes circuit R-O. This energizes the reversing valve solenoid (RVS) and places the unit in standby condition for cooling.

As the space temperature continues to rise, the second stage of the thermostat makes, closing circuit R-Y. When compressor time delay (5± 2 minutes) is completed, a circuit is made to contactor (C), starting the compressor (COMP) and outdoor-fan motor (OFM). Circuit R-G is made at the same time, starting the indoor-fan motor (IFM) after a 1-second delay.

When the thermostat is satisfied, contacts open, deenergizing C. The COMP and OFM stop, and the IFM stops after a short time delay.

Heating — On a call for heat, thermostat makes circuit R-Y and R-G. When compressor time delay (5 ± 2 minutes) is completed, a circuit is made to C, Starting COMP and OFM. Circuit R-G also starts IFM after 1-second delay.

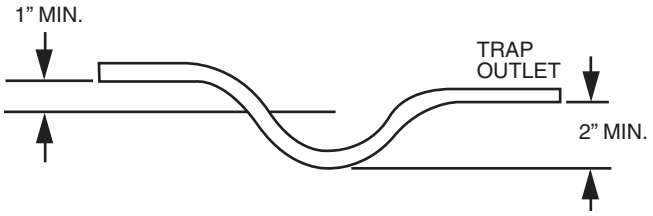
Should room temperature continue to fall, circuit R-W is made through second-stage thermostat bulb. If optional electric heat package is used, a relay is energized, bringing on first bank of supplemental electric heat. When thermostat is satisfied, contacts open, deenergizing contactor and relay; motors and heaters deenergize. The IFM may be controlled by a time-delay relay that keeps the fan on for 30 seconds.

Defrost — Defrost board (DB) is a time and temperature control, which includes a field-selectable time period between checks for defrost (30, 50, and 90 minutes). Electronic timer and defrost cycle start only when contactor is energize and defrost thermostat (DFT) is closed.

Defrost mode is identical to Cooling mode, except OFM stops and a bank of optional electric heat turns on to warm air supplying the conditioned space.

Application data

Condensate trap — A 2-in. condensate trap must be field supplied.



Maximum cooling airflow — To minimize the possibility of condensate blow-off from the evaporator, airflow through the units should not exceed 450 cfm/ton.

Minimum cooling airflow — The minimum cooling airflow is 350 cfm/ton.

Minimum cooling ambient operating temperature — All standard units have a minimum ambient operating temperature of 40°F. With accessory low ambient temperature kit, units can operate at temperatures down to 0°F.

Maximum operating outdoor air temperature — Maximum outdoor operating air temperature for cooling is 125°F.

Electrical data

UNIT 50HX SIZE-SERIES	V-PH (60 Hz)	VOLTAGE RANGE		COMPRESSOR		OFM	IFM	ELECTRIC HEAT		SINGLE-POINT POWER SUPPLY			DUAL-POINT POWER SUPPLY (INCLUDING UNIT ONLY)					
		Min	Max	RLA	LRA	FLA	FLA	kW	FLA	Single-Point Wiring MCA	Single-Point Max Fuse or Ckt Bkr	Single-Point MOCP	Heater Only Dual-Point Wiring MCA	Heater Only Dual-Point Max Fuse or Ckt Bkr	Heater Only Dual-Point MOCP	Unit Only Dual-Point MCA	Unit Only Dual-Point Max Fuse or Ckt Bkr	Unit Only Dual Point **MOCP**
024-311	208/230-1	187	253	11.2	56.0	1.4	2.0	3.75/5.00	18.1/20.8	40.3/43.4	45/45	—	22.5/26.0	25/30	—	17.4	25/25	—
								5.60/7.50	27.1/31.3	51.0/56.5	60/60	—	33.7/39.1	35/40	—			
								7.50/10.0	36.1/41.7	62.5/69.5	—	70/70	45.1/50.8	50/60	—			
024-321	208/230-1	187	253	12.1	54.0	1.4	2.0	3.75/5.00	18.1/20.8	41.4/44.5	45/45	—	22.5/26.0	25/30	—	18.5	25/25	—
								5.60/7.50	27.1/31.3	52.2/57.7	60/60	—	33.7/39.1	35/40	—			
								7.50/10.0	36.1/41.7	63.7/70.7	—	70/80	45.1/50.8	50/60	—			
030	208/230-1	187	253	15.0	73.0	1.4	2.6	3.75/5.00	18.1/20.8	45.6/48.8	50/50	—	22.5/26.0	25/30	—	22.8	30/30	—
								5.60/7.50	27.1/31.3	56.4/61.9	60/–	–/70	33.7/39.1	35/40	—			
								7.50/10.0	36.1/41.7	67.9/74.9	—	70/80	45.1/50.1	50/60	—			
								11.30/15.0	54.1/62.0	90.6/100.9	—	100/110	67.9/78.1	—	70/80			
036	208/230-1	187	253	16.0	88.0	1.2	2.6	3.75/5.00	18.1/20.8	46.7/49.8	50/50	—	22.5/26.0	25/30	—	23.8	30/30	—
								5.60/7.50	27.1/31.3	57.6/62.9	60/–	–/70	33.7/39.1	35/40	—			
								7.50/10.0	36.1/41.7	68.9/75.9	—	70/80	45.1/50.1	50/60	—			
								11.30/15.0	54.1/62.0	91.7/101.9	—	100/110	67.9/78.1	—	70/80			
042	208/230-1	187	253	20.0	104.0	1.4	3.1	3.75/5.00	18.1/20.8	52.4/55.5	60/60	—	22.5/26.0	25/30	—	29.5	35/35	—
								5.60/7.50	27.1/31.3	63.1/68.6	—	70/70	33.7/39.1	35/40	—			
								7.50/10.0	36.1/41.7	74.6/81.6	—	80/90	45.1/50.8	50/60	—			
								11.30/15.0	54.1/62.0	97.4/107.6	—	100/110	67.9/78.1	—	70/80			
								15.0/20.0	72.2/83.3	119.0/133.1	—	125/150	90.1/104.2	—	100/110			
048-301	208/230-1	187	253	26.4	129.0	2.1	7.2	3.75/5.00	18.1/20.8	65.2/68.3	—	70/70	22.5/26.0	25/30	—	42.3	50/50	—
								5.60/7.50	27.1/31.3	75.9/81.4	—	80/90	33.7/39.1	35/40	—			
								7.50/10.0	36.1/41.7	87.4/94.4	—	90/100	45.1/50.8	50/60	—			
								11.30/15.0	54.1/62.0	110.2/120.4	—	125/125	67.9/78.1	—	70/80			
								15.0/20.0	72.2/83.3	131.8/145.9	—	150/150	90.1/104.2	—	100/110			
048-311	208/230-1	187	253	20.8	109.0	2.1	7.2	3.75/5.00	18.1/20.8	58.2/61.3	60/–	–/70	22.5/26.0	25/30	—	35.3	45/45	—
								5.60/7.50	27.1/31.3	68.9/74.4	—	70/80	33.7/39.1	35/40	—			
								7.50/10.0	36.1/41.7	80.4/87.4	—	90/90	45.1/50.8	50/60	—			
								11.30/15.0	54.1/62.0	103.2/113.4	—	110/125	67.9/78.1	—	70/80			
								15.0/20.0	72.2/83.3	124.8/138.9	—	125/150	90.1/104.2	—	100/110			
060	208/230-1	187	253	32.1	169.0	2.1	7.2	3.75/5.00	18.1/20.8	72.3/75.4	—	80/80	22.5/26.0	25/30	—	49.4	60/60	—
								5.60/7.50	27.1/31.3	83.1/88.6	—	90/90	33.7/39.1	35/40	—			
								7.50/10.0	36.1/41.7	94.6/101.6	—	100/110	45.1/50.8	50/60	—			
								11.30/15.0	54.1/62.0	117.3/127.6	—	125/150	67.9/78.1	—	70/80			
								15.0/20.0	72.2/83.3	138.9/153.1	—	150/175	90.1/104.2	—	100/110			

(See Legend following Electrical Data chart)

LEGEND

FLA — Full Load Amps
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
RLA — Rated Load Amps

*Heater capacity (KW) based on heater voltage of 208v, 240v, & 480v. If power distribution voltage to unit varies from rated heater voltage, heater KW will vary accordingly.

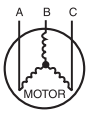
NOTES:

1. In compliance with NEC (National Electrical Code) requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be Power Supply fuse. The CGA (Canadian Gas Association) units may be fuse or circuit breaker.
2. Minimum wire size is based on 60 C copper wire. If other than 60 C wire is used, or if length exceeds wire length in table, determine size from NEC.
3. Unbalanced 3-Phase Supply Voltage
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percentage of voltage imbalance.

   % Voltage imbalance

   $$= 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

EXAMPLE: Supply voltage is 460-3-60.



AB = 452 v
BC = 464 v
AC = 455 v

$$\text{Average Voltage} = \frac{452 + 464 + 455}{3}$$

$$= \frac{1371}{3}$$

$$= 457$$

Determine maximum deviation from average voltage.
(AB) 457 452 = 5 v
(BC) 464 457 = 7 v
(AC) 457 455 = 2 v

Maximum deviation is 7 v.

Determine percent of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{7}{457}$$

$$= 1.53\%$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

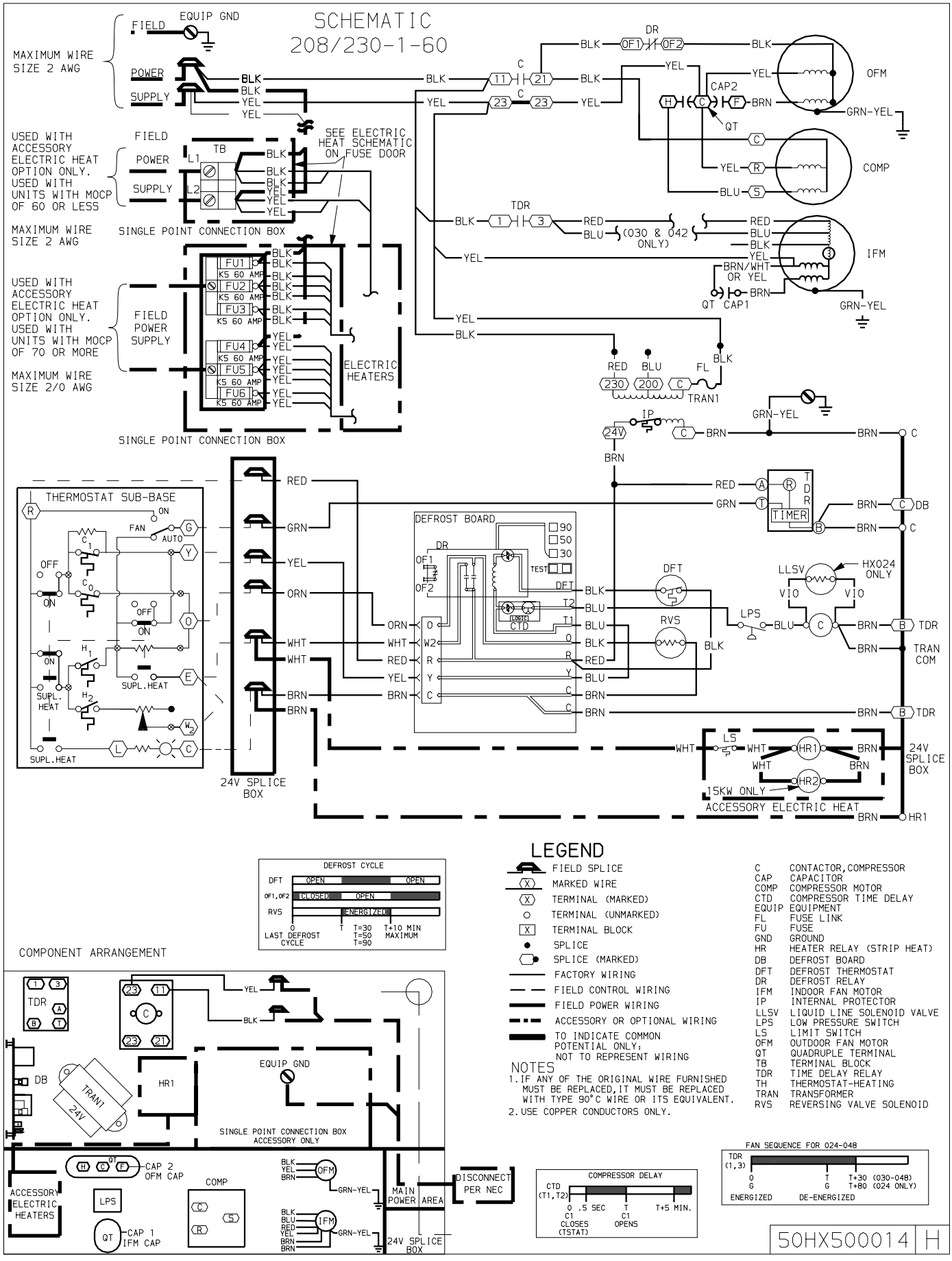
IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.

WATTAGE MULTIPLICATION FACTORS

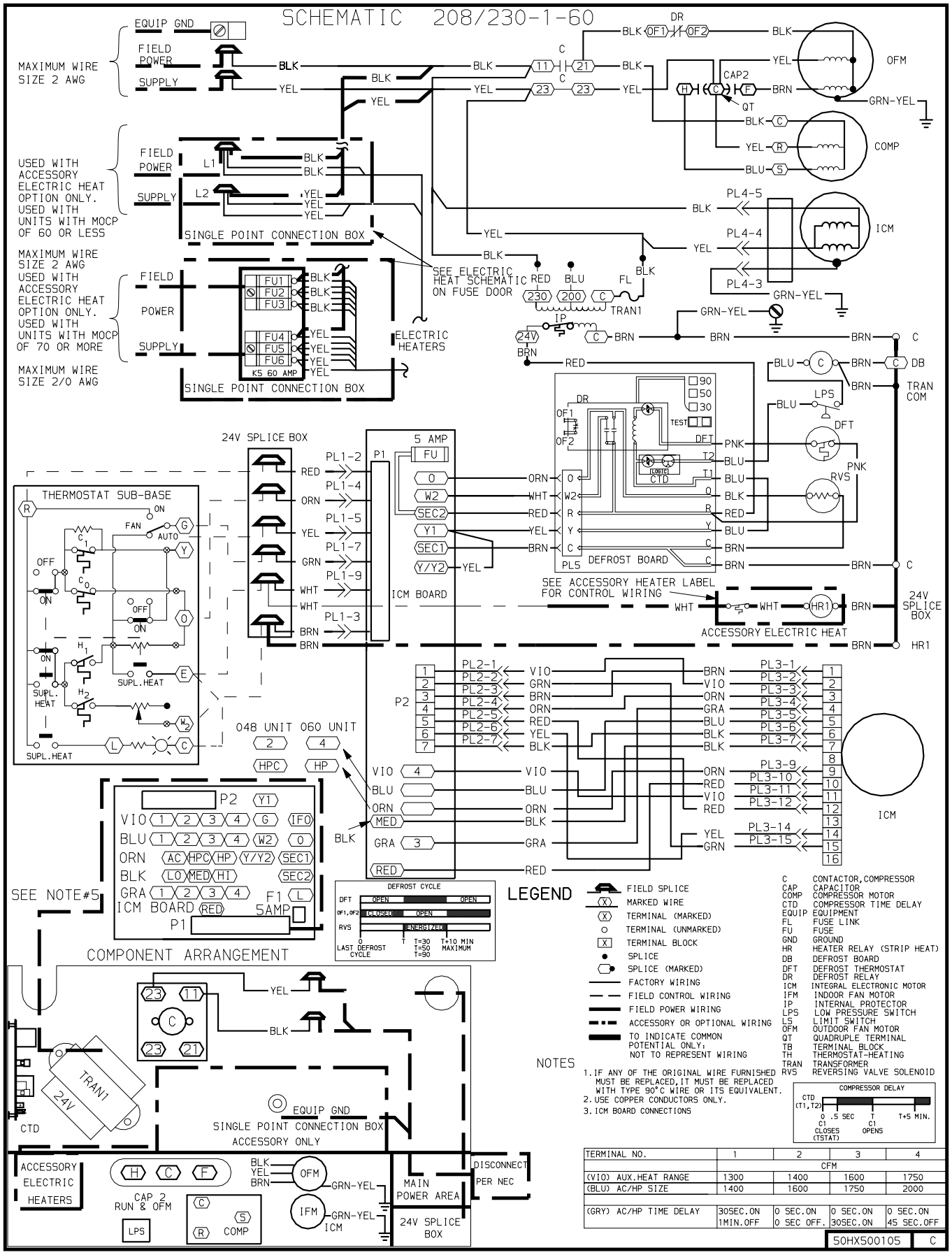
HEATER VOLTAGE RATING	ACTUAL HEATER VOLTAGE	MULTIPLICATION FACTOR
240	200	0.69
	208	0.75
	220	0.84
	230	0.92
	240	1.00

EXAMPLE: 20.0 kW (at 240 v) heater on 230 v
= 20.0 (0.92 multiplication factor)
= 18.4 kW capacity at 230 v

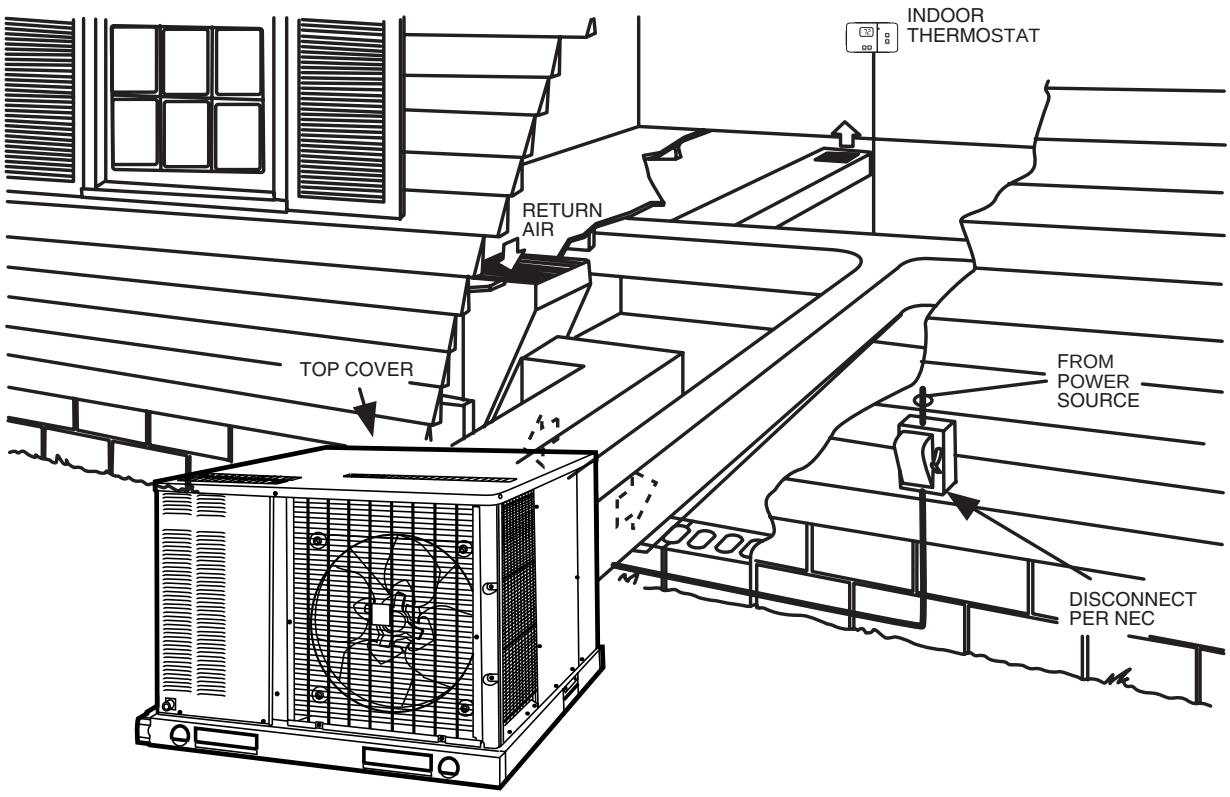
Typical wiring diagram — 024-042 (208/230-60-1 with PSC Indoor)

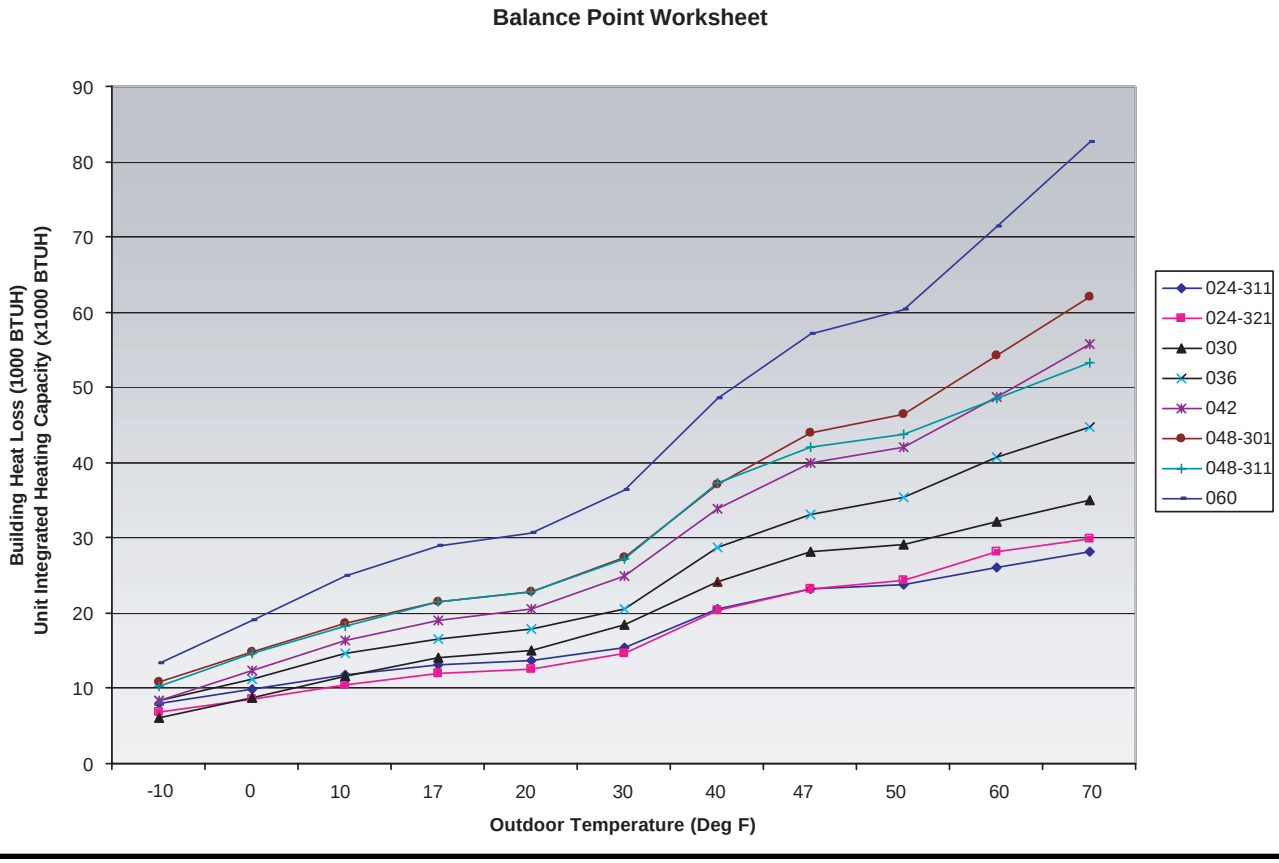


Typical wiring diagram — 048-060 (208/230-60-1 with ECM Indoor)



Typical piping and wiring





Guide specifications

Packaged Rooftop Air-to-Air Heat Pump
Constant Volume Application

HVAC Guide Specifications
Size Range: **2 to 5 Tons, Nominal Cooling**
23,800 to 57,000 Btuh (Heating)
Carrier Model Number: **50HX**

Part 1—General

1.01 SYSTEM DESCRIPTION

Outdoor package, electrically controlled, air-to-air heat pump utilizing a scroll compressor for heating and cooling duty. Unit shall discharge supply air horizontally or vertically as shown on contract drawings.

1.02 QUALITY ASSURANCE

A. Unit shall be rated in accordance with ARI Standards 210/240 and 270 latest revisions. Designed in accordance with UL Standard 1995.
B. Unit shall be designed to conform to ASHRAE 15.
C. Unit shall be UL listed and UL, Canada, certified as a total package for safety requirements.
D. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.
E. Unit shall be manufactured in a facility registered to ISO 9002 (International Standards Organization) Manufacturing quality standard.

1.03 DELIVERY, STORAGE AND HANDLING

Unit shall be stored and handled per manufacturer's recommendations.

Part 2 — Products

2.01 EQUIPMENT

A. General:
Factory-assembled, single-piece, air-to-air heat pump. Contained within the unit enclosure shall be all factory wiring, piping, controls, and refrigerant charge (R-22).
B. Unit Cabinet:
1. Unit cabinet shall be constructed of phosphated, bonderized, zinc-coated, prepainted steel, capable of withstanding 500 hours in salt spray, Federal Test Method Std. No. 141 (method 6061).
2. Indoor fan compartment cabinet surfaces shall be insulated with a minimum 1/2 in. thick, flexible fiberglass insulation, coated on the air side, with aluminum foil-faced fiberglass insulation.
3. Cabinet panels shall be easily removable for servicing.
4. Unit shall have a factory-installed sloped, noncorrosive condensate drain.
5. Unit insulation conforms to ASHRAE 62P.
6. Unit shall have single-piece top cover.
C. Fans:
1. Indoor Blower (Indoor Fan):
a. Fan shall be 3-speed (sizes 024-042) or variable speed (sizes 048 and 060) direct drive as shown on the equipment drawings.
b. Fan wheel shall be made from steel, be double inlet type. It shall have forward-curved blades with a corrosion resistant finish and be dynamically balanced.
2. Outdoor fan shall be of the direct-drive propeller type with aluminum blades, riveted to corrosion resistant steel spiders. It shall be dynamically balanced, and discharge air vertically upwards or horizontally.
D. Scroll Compressor:
Fully hermetic, scroll type with internal and external vibration isolation.
E. Coils:
1. Indoor and outdoor coils shall have aluminum plate fins mechanically bonded to seamless copper tubes with all joints brazed.
2. Tube sheet openings shall be belled to prevent tube wear.
F. Refrigerant Components:
Acutrol™ feed system.
G. Controls and Safeties:
1. Unit controls:
a. Unit shall be complete with self-contained low-voltage control circuit.
b. Unit shall incorporate an outdoor-coil defrost system to prevent excessive frost accumulation during heating duty, and shall be controlled as follows:
1) Defrost shall be initiated on the basis of time and coil temperature.
2) A 30/50/90 minute timer shall activate defrost cycle only if coil temperature is low enough to indicate a heavy frost condition.
3) Defrost cycle shall terminate when defrost thermostat is satisfied or shall have a positive termination time of 10 minutes.
2. Safeties:
a. Compressor, overtemperature, overcurrent.
b. Refrigerant lines — strainer, loss-of-charge switch.
H. Operating Characteristics:
1. Unit shall be capable of starting and running at 115°F ambient outdoor temperature per maximum load criteria of ARI Standard 240, latest revision.
2. Scroll compressor with standard controls shall be capable of operation down to 40°F ambient outdoor temperature in cooling duty.
3. Scroll compressor shall be capable of operation in heating duty down to –20°F ambient outdoor-air temperature.
4. Unit shall be capable of simultaneous heating duty and defrost cycle operation when using electric heaters indicated in Second K, Special Features.
5. Compressors will be prevented from restarting for a minimum of 5 minutes after shutdown.

Guide specifications (cont)

I. Electrical Requirements:
All unit power wiring shall enter unit cabinet at a single location.

J. Motors:
1. Compressor motors shall be of the refrigerant cooled type with line break thermal and current overload protection.
2. All fan motors shall have permanently lubricated bearings and inherent automatic-reset thermal overload protection.
3. Outdoor-fan motor shall be totally enclosed.

K. Special Features Available:
1. Electric Resistance Heaters:
   a. Open-wire nichrome elements with all necessary safety and operating controls.
   b. Heaters are UL listed as indicated on basic unit informative plate.
   c. Each heater assembly shall include the following safety features:
      1) Automatic-reset switches.
      2) Heat limiters for primary and secondary, overcurrent, and thermal protection.
   d. Available with power single-point connections.
2. Outdoor Thermostat Kit:
Thermostat allows for staging of electric heaters based on outdoor-air temperature.
3. Programmable Thermostat:
Thermostat provides 2-stage heating and 2-stage cooling control with remote communication ability.
4. Control Upgrade Package:
High- and low-pressure switches protect the compressor against improper refrigerant pressures.
5. Low-Ambient Kit:
Permits cooling operation at outdoor temperature as low as 0°F.
6. Factory-Assembled Roof Curb:
Provides one-piece support for downflow applications.
7. 30% Open Manual Outdoor-Air Damper:
Provides for minimum outdoor air and is manually adjustable.
8. One-inch Filter Rack:
Provides internal filtering performance.
9. Duct Cover Kit:
Covers horizontal ducts after unit has been converted to downflow discharge. (Not required with units equipped with downflow option.)
10. Lifting Bracket Kit:
Provides attachment points for rigging straps. (Not required for units equipped with optional base rail.)
11. Rectangular Duct Connection Kit:
Allows easy conversion from round to rectangular ducts. (Not required for sizes 048, 060.)
12. Base Rail:
Provides holes for rigging and fork lifts as well as an elevated base for horizontal applications.
13. Downflow Option:
Provides for easy vertical ductwork connections.
14. Downshot-to-Sideshot Conversion Kit:
Converts a dedicated downshot (vertical) discharge unit to a sideshot (horizontal) discharge unit.
15. Coil Options:
Shall include factory-installed optional tin plated indoor, copper/copper and vinyl-coated refrigerant coils.

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.